Sugar Bulletin, No. 12.

DEPARTMENT OF AGRICULTURE,
BRITISH GUIANA.

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FOREWORD.

FIELD EXPERIMENTS WITH SUGAR CANE, XII.

THE VARIETY AND FERTILIZER POSITION OF THE SUGAR INDUSTRY, IX.

LABOUR INVESTIGATIONS.

REPORT ON THE SUGAR EXPERIMENT STATIONS FOR THE YEAR 1943.

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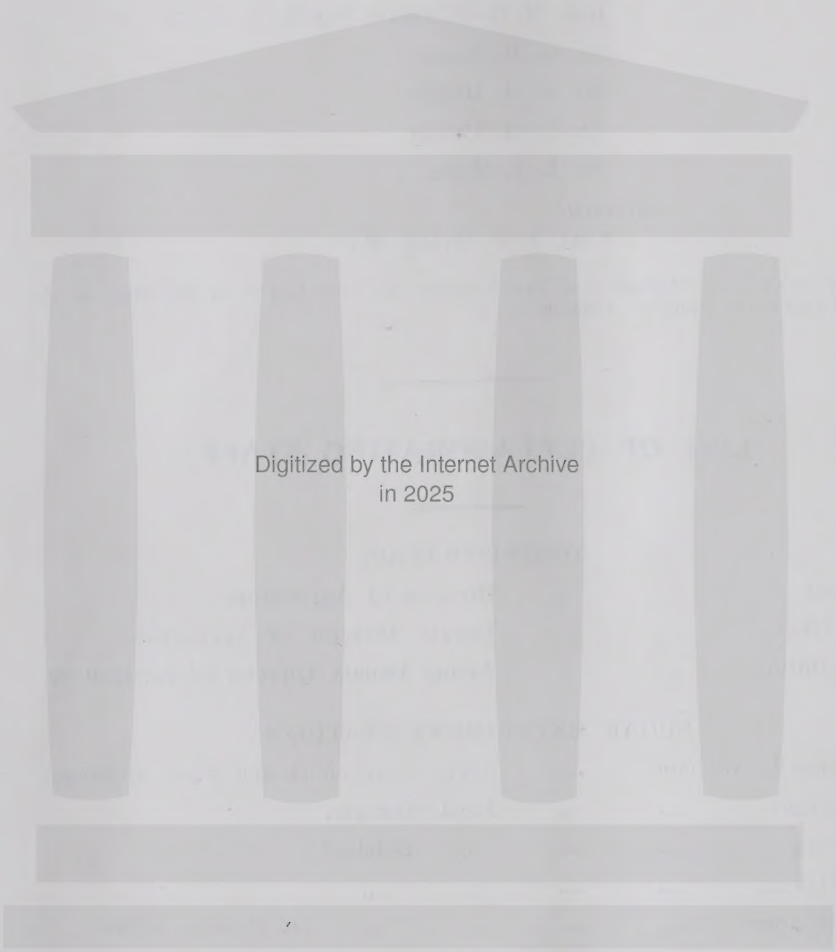

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FOREWORD.

This the twelfth Sugar Bulletin of the series records :

(1) Results of Sugar-cane experiments from July, 1942 to December, 1943, including both variety and manurial trials;
(2) The variety and fertilizer position of the sugar industry to date;
(3) Results of investigations connected with labour requirements of the sugar industry in the Colony;
(4) General report on the Experiment Stations for 1943.

2. Work for the period has been severely handicapped by abnormal weather resulting in flood conditions in many parts of the Colony, lack of fertilizers owing to exigencies of war, and labour difficulties due to causes beyond the control of the industry; these last include employment in other fields of activity—timber and bauxite industries and the "Grow More Food" Campaign. Yields have fallen and the total sugar output of the Colony was still further prejudiced in 1943 as a result of shipping shortage, and the consequential steps which had to be taken to restrict manufacture.

3. The results of the experimental work are clearly presented, while the Stations' report indicates the amount of breeding work attempted during the period. On the variety side, while P.O.J. 2878 is still the leading commercial cane, this variety is being challenged by seedlings locally bred, such as D. 14/33, D. 419/33, D. 14/34 and D. 166/34. The '36 series of seedlings also contains some promising new canes. On the manurial side, new work with nitrogenous manures, such as sodium nitrate and calcium cyanamide, compared with sulphate of ammonia is recorded. It will be seen that sulphate of ammonia is still the most preferable under local conditions. There are some indications of limited usefulness in certain areas of phosphate and potash applications. In the organic group, pen manure, filter press cake and molasses all show future possibilities.

4. The labour difficulties of the past two years have pointed to the need for reliable and easily collated statistics on such matters as labour attendance, labour required per acre or per ton of sugar, etc. It is understood that the papers on these matters which appear in this Bulletin have been welcomed by those most concerned, but it should be emphasized that more uniformity in the keeping of records is desirable. It seems highly probable that with little or no additional effort a great deal of reliable and useful information could be available to the industry if a small Committee investigated the matter and issued a scheme of directives for general guidance.

5. Apart from the difficulties mentioned in paragraph 2 above, the research work has been greatly handicapped of late by very frequent staff changes and the need for working within a modest budget in the face of increasing costs for labour and supplies. The volume and standard of work here recorded justify the most generous consideration that circumstances permit. Money spent on research is a sound investment.

J. SYDNEY DASH,
Director of Agriculture.

FIELD EXPERIMENTS WITH SUGAR CANE, XII.

BY

C. HOLMAN B. WILLIAMS, *Sugar Agronomist and Plant Breeder,*

AND

C. CAMERON, *Field Manager.*

INTRODUCTION.

This paper records the results of 53 variety and 61 manurial trials reaped during the eighteen months ended December 31, 1943. The experiments were laid out to permit of the analysis of variance.

Table I shows that the total rainfall for the period was some forty per cent. above the normal. The six months ending with May, 1943, were particularly heavy, beginning with an unprecedented fall of nearly 38 inches in December, 1942, and closing with a total more than 100 per cent. above the average. In November, 1943, the amount registered was nearly three times the average, but precipitation was continuously subnormal from June to October, 1943.

TABLE I.—**Comparison of the July—December Rainfall at Sophia Sugar Experiment Station for 1942—43 with the average for 1921-43.**

Month.	Actual Rainfall, 1942—1943, in.	Average Rainfall, 1921—1943, in.	Excess or Deficit, in.
July, 1942	15.41	11.19	4.22
August, ,,	5.18	8.16	−2.98
September, ,,	2.22	2.53	−0.31
October, ,,	6.56	4.05	2.51
November, ,,	0.32	5.70	−5.38
December, ,,	37.81	14.73	23.08
January, 1943	18.35	9.06	9.29
February, ,,	8.79	4.07	4.72
March, ,,	8.92	4.56	4.36
April, ,,	13.23	5.89	7.36
May, ,,	17.60	11.44	6.16
June, ,,	13.26	14.47	−1.21
July, ,,	7.57	11.19	−3.62
August, ,,	4.88	8.16	−3.28
September, ,,	0.92	2.53	−1.61
October, ,,	3.77	4.14	−0.37
November, ,,	15.00	5.70	9.30
December, ,,	19.17	14.73	4.44
Total	198.98	142.30	56.68

The hearty co-operation of the commercial sugar producers in the execution of the work here reported is very gratefully acknowledged.

VARIETY TRIALS.

The variety trials are considered under four sub-sections, *viz.*:—

(a) Plant cane variety trials;

(b) First ratoon variety trials;

(c) Second ratoon variety trials;

(d) Discussion and summary.

SUB-SECTION A.—PLANT CANE VARIETY TRIALS.

Plant Cane Variety Trials Reaped at Sophia Sugar Experiment Station.

The results of the fourteen plant cane variety trials harvested at the Sophia Sugar Experiment Station are presented in Table II. It will be seen that:—

i. Yields were average to good for the Station except in Fields 4 E., 12 E. "B," and 3 W.

ii. Cane quality was generally satisfactory although Fields 4 and 14 E. and 16 W. were reaped rather late through unavoidable circumstances. D. 79/36 in Field 13 E. "A," D. 33/37 in Field 13 E. "B," D. 166/34 in Field 14 E. "A," and D. 201/36 in Field 4 W. "A," however, yielded cane of poor quality.

iii. Both as regards tonnage and quality, D. 14/33 (Co. 281 x Diamond 10) was better than P.O.J. 2878 in all six comparisons which were made.

iv. D. 419/33 (Co. 281 x Diamond 10) was significantly better than P.O.J. 2878 in the one test in which they met.

v. D. 166/34 (P.O.J. 2878 x Sorghum) was above P.O.J. 2878 in ten out of the thirteen tests in which they met, averaging 2.94 more tons of cane and 0.56 ton more sucrose per acre for the thirteen experiments.

vi. D. 200/36 (P.O.J. 2878 x Co. 213) and D. 25/38 (Co. 421 x Diamond 10) appeared twice each and both surpassed P.O.J. 2878 by convincing margins in their respective tests. They were satisfactory in respect both of tonnage and quality.

vii. B. 34104 (Co. 281 x B.H. 10/12) met P.O.J. 2878 in six tests and was superior to the standard in each, the margins being wide in every case and statistically significant on four occasions. It was consistently of better quality than P.O.J. 2878.

viii. Certain varieties (*e.g.*, D. 61/36, D. 201/36, D. 38/38, D. 51/38) deserve further investigation while others (*e.g.*, D. 81/35, D. 79/36, D. 20/37, D. 2/38) can be discarded.

TABLE II.—Results of Plant Cane Variety Trials Reaped at Sophia Sugar Experiment Station.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre	
						Tons.	% Mean.
	Sophia, Field 4 E. "A." Reaped 27.viii.43 at 15.25 months.						
MEANS OF 4 PLOTS:	D. 166/34	23.56	14.65	4.30	88.3	3.45	125.45
	P.O.J. 2878	21.55	14.50	5.30	88.7	3.12	113.45
	D. 81/37	20.69	14.03	4.57	89.3	2.90	105.45
	D. 96/37	17.94	13.56	4.84	89.4	2.43	88.36
	D.81/35	19.89	11.94	7.79	86.3	2.37	86.18
	D.134/34	15.54	14.38	4.24	89.2	2.24	81.45
	Mean:					2.75	100.00
	Significant Difference, 20: 1:					—	—
	Sophia, Field 4 E. "B." Reaped 27.viii.43 at 15.25 months.						
MEANS OF 4 PLOTS:	D. 166/34	29.43	14.57	5.20	88.5	4.29	126.55
	D. 51/38	30.55	12.17	4.51	89.8	3.71	109.44
	D. 64/38	30.24	12.16	7.14	84.7	3.68	108.55
	D. 14/33	24.02	14.95	2.79	91.1	3.59	105.90
	D. 14/37	25.95	12.91	4.63	89.5	3.35	98.82
	P.O.J. 2878	22.47	13.57	4.75	88.9	3.05	89.97
	D. 120/37	21.06	12.93	4.89	90.2	2.72	80.24
	D. 2/38	20.50	13.20	5.20	87.1	2.70	79.65
	Mean:					3.39	100.00
	Significant Difference, 20: 1:					0.68	20.06
	Sophia, Field 12 E. "A." Reaped 27.x.42 at 13.75 months.						
MEANS OF 5 PLOTS:	D. 25/38	43.00	14.18	5.38	87.9	6.10	126.56
	D. 200/36	40.63	14.91	5.26	87.8	6.06	125.73
	D. 28/38	36.61	13.72	4.88	87.7	5.02	104.15
	D. 54/38	39.43	12.40	7.03	86.5	4.89	101.45
	D. 14/33	31.29	14.66	6.66	88.3	4.59	95.23
	D. 1/37	34.52	12.85	6.14	88.5	4.44	92.12
	P.O.J. 2878	30.68	13.82	5.99	87.3	4.24	87.97
	D. 27/38	34.86	11.70	7.45	86.1	4.08	84.65
	D. 166/34	25.86	15.22	5.54	88.4	3.94	81.74
	Mean:					4.82	100.00
	Significant Difference, 20: 1:					0.84	17.43
	Sophia, Field 12 E. "B." Reaped 27.x.42 at 13.75 months.						
MEANS OF 5 PLOTS:	D. 166/34	29.10	14.53	5.89	89.5	4.23	112.80
	D. 38/38	28.34	14.90	4.91	87.8	4.22	112.53
	D. 43/38	30.10	14.00	5.12	89.6	4.21	112.27
	D. 2/38	25.83	13.24	6.71	87.5	3.42	91.20
	D. 36/37	24.86	13.38	5.77	88.0	3.33	88.80
	P.O.J. 2878	25.21	12.38	6.71	85.3	3.12	83.20
	Mean:					3.75	100.00
	Significant Difference, 20: 1:					0.68	18.13
	Sophia, Field 13 E. "A." Reaped 20.x.42 at 13.00 months.						
MEANS OF 5 PLOTS:	D. 25/38	40.04	15.09	4.94	86.9	6.04	127.16
	D. 27/38	40.54	13.70	6.36	87.6	5.55	116.84
	D. 14/33	33.09	15.10	5.97	89.4	5.00	105.26
	D. 201/36	36.72	13.59	8.47	84.8	4.99	105.05
	D. 166/34	34.53	14.20	6.77	88.7	4.90	103.16
	P.O.J. 2878	33.04	14.05	9.64	87.3	4.64	97.68
	D. 52/38	31.90	14.00	7.38	87.5	4.47	94.11
	D. 79/36	33.17	12.42	11.56	83.4	4.12	86.74
	D. 20/37	22.42	13.39	8.49	84.8	3.00	63.16
	Mean:					4.75	100.00
	Significant Difference, 20: 1:					0.72	15.16

TABLE II (Contd.).—**Results of Plant Cane Variety Trials Reaped at Sophia Sugar Experiment Station.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.
	Sophia, Field 13 E. "B." Reaped 20.x.42 at 13.00 months.						
MEANS OF 5 PLOTS:	D. 134/34	33.36	14.69	6.21	90.4	4.90	116.11
	D. 166/34	33.48	13.78	6.50	88.2	4.61	109.24
	B. 34104	32.14	14.29	5.49	90.2	4.59	108.77
	D. 82/35	28.95	15.34	4.69	90.7	4.44	105.21
	D. 75/35	33.28	13.31	8.84	86.0	4.43	104.98
	D. 33/37	37.16	10.71	12.33	84.1	3.98	94.31
	D. 143/35	27.54	14.32	6.57	88.3	3.94	95.36
	D. 94/35	29.64	12.78	5.96	88.4	3.79	89.81
	P.O.J. 2878	26.97	12.10	7.88	85.1	3.26	77.25
	Mean:					4.22	100.00
	Significant Difference, 20: 1					0.81	19.19
	Sophia, Field 14 E. "A." Reaped 9.ix.43 at 16.50 months.						
MEANS OF 4 PLOTS:	D. 1/37	47.72	14.79	4.01	90.8	7.06	126.30
	P.O.J. 2878	34.18	14.47	3.44	90.7	4.95	88.55
	D. 166/34	38.93	12.26	10.39	85.8	4.77	85.33
	Mean:					5.59	100.00
	Significant Difference, 20: 1:					1.07	19.14
	Sophia, Field 14 E. "B." Reaped 9.ix.43 at 16.50 months.						
MEANS OF 4 PLOTS:	B. 34104	44.12	15.19	6.74	89.9	6.70	126.18
	D. 14/33	40.70	15.70	5.59	92.0	6.39	120.34
	D. 81/37	37.85	14.55	5.99	90.4	5.50	103.58
	D. 14/37	39.32	13.24	6.10	86.4	5.20	97.93
	D. 166/34	33.27	14.74	8.31	88.9	4.90	92.28
	P.O.J. 2878	33.07	14.40	4.05	87.7	4.76	89.64
	D. 120/37	27.74	13.53	6.75	87.8	3.75	70.62
	Mean:					5.31	100.00
	Significant Difference, 20: 1:					1.10	20.68
	Sophia, Field 16 E. Reaped 8.ix.42 at 13.50 months.						
MEANS OF 5 PLOTS:	B. 34104	41.62	14.59	4.49	91.0	6.07	133.11
	D. 119/33	36.19	14.73	6.62	88.4	5.33	116.89
	D. 1/37	36.14	14.66	6.69	89.1	5.30	116.23
	D. 166/34	33.03	14.34	8.87	88.8	4.74	103.95
	P.O.J. 2878	32.34	13.94	6.28	88.8	4.51	98.90
	D. 552/33	33.25	13.50	9.13	87.8	4.49	98.46
	D. 134/34	29.89	14.67	6.51	91.1	4.38	96.05
	D. 132/35	29.19	14.51	5.89	90.3	4.24	92.98
	D. 226/35	29.73	13.41	8.46	87.3	3.99	87.50
	D. 216/36	28.65	13.18	9.42	85.1	3.78	82.89
	D. 50/37	25.21	13.37	6.65	88.6	3.37	73.90
	Mean:					4.56	100.00
	Significant Difference, 20: 1:					0.71	15.57
	Sophia, Field 3 W. "A." Reaped 19.v.43 at 13.50 months.						
MEANS OF 4 PLOTS:	D. 166/34	24.90	14.96	5.25	92.4	3.72	124.83
	D. 82/35	21.87	13.64	5.04	92.4	2.98	100.00
	D. 81/35	19.88	14.05	4.95	92.0	2.79	93.62
	P.O.J. 2878	18.04	13.35	6.14	89.6	2.41	80.87
	Mean:					2.98	100.00
	Significant Difference, 20: 1:					0.77	25.84

TABLE II (Contd.).—**Results of Plant Cane Variety Trials Reaped at Sophia Sugar Experiment Station.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.
	Sophia, Field 3 W. "B." Reaped 19.v.43 at 13.50 months.						
MEANS OF 4 PLOTS:	D. 166/34	28.56	16.65	4.46	93.7	4.76	116.95
	D. 61/36	28.55	16.20	5.31	92.5	4.63	113.76
	D. 14/33	27.85	16.21	3.94	92.2	4.51	110.81
	B. 34104	27.16	15.05	4.33	92.1	4.09	100.49
	D. 134/34	26.50	14.93	7.32	91.3	3.96	97.30
	D. 1/37	25.17	14.91	4.87	91.1	3.75	92.14
	D. 226/35	27.11	13.58	6.22	86.9	3.68	90.42
	P.O.J. 2878	21.92	14.41	5.11	90.9	3.16	77.64
	Mean:					4.07	100.00
	Significant Difference, 20 : 1 :					0.82	20.15
	Sophia, Field 4 W. "A." Reaped 11.iii.43 at 13.25 months.						
MEANS OF 4 PLOTS:	D. 200/36	44.30	13.38	9.24	86.2	5.93	108.61
	D. 201/36	42.02	13.70	14.09	85.4	5.76	105.49
	P.O.J. 2878	36.72	14.23	8.36	86.3	5.22	95.60
	D. 166/34	36.73	13.49	6.49	86.1	4.95	90.66
	Mean:					5.46	100.00
	Significant Difference, 20 : 1 :					—	—
	Sophia, Field 4 W. "B." Reaped 11.iii.43 at 13.25 months.						
MEANS OF 4 PLOTS:	D. 14/33	30.04	15.28	4.97	90.9	4.59	114.46
	D. 1/37	31.85	13.27	8.01	86.8	4.23	105.49
	B. 34104	29.32	13.79	7.20	89.5	4.04	100.75
	D. 166/34	27.38	13.89	6.85	87.1	3.80	94.76
	P.O.J. 2878	24.40	13.90	7.42	88.0	3.39	84.54
	Mean:					4.01	100.00
	Significant Difference, 20 : 1 :					0.71	17.71
	Sophia, Field 16 W. Reaped 4.iv.42 at 15.50 months.						
MEANS OF 5 PLOTS:	D. 81/35	33.67	14.72	6.09	90.9	4.96	122.47
	B. 34104	33.68	14.64	5.89	90.3	4.93	121.73
	D. 23/37	32.49	14.56	6.72	88.7	4.73	116.79
	D. 143/35	30.00	14.47	7.00	89.5	4.34	107.16
	P.O.J. 2878	29.73	14.57	5.52	89.7	4.33	106.91
	D. 75/35	29.27	14.61	5.93	89.2	4.28	105.68
	D. 552/33	28.82	14.56	6.89	88.8	4.20	103.70
	D. 172/35	28.04	14.45	6.37	90.0	4.05	100.00
	D. 199/36	25.94	13.88	7.22	86.1	3.60	88.89
	D. 143/37	26.90	11.90	8.37	85.9	3.20	79.01
	D. 216/36	22.69	13.89	7.95	86.3	3.15	77.78
	D. 80/35	22.13	13.01	7.91	83.1	2.88	71.11
	Mean:					4.05	100.00
	Significant Difference, 20 : 1 :					1.03	25.43

PLANT CANE VARIETY TRIALS REAPED IN BERBICE AND EAST AND WEST DEMERARA.

Data from the four plant cane variety trials carried out on the estates appear in Table III, and attention may be called to the following points:—

i. Very similar yields and quality were recorded on the estates as at the Sugar Experiment Station (Table II).

ii. The test at Rose Hall was reaped a little early and the D. 200/36 was apparently not quite mature. The experiment at Providence, Demerara, was not reaped until it was sixteen months of age.

iii. D. 14/33 (Co. 281 x Diamond 10) did well at Rose Hall but was disappointing at Lusignan where the field suffered considerably from the abnormal weather and labour conditions.

iv. D. 166/34 (P.O.J. 2878 x Sorghum) surpassed P.O.J. 2878 in three out of the four tests, being significantly better on two occasions. It averaged 5.76 tons of cane and 0.88 ton of sucrose more per acre for the four experiments.

v. D. 200/36 (P.O.J. 2878 x Co. 213) again registered its superiority over the standard, although it appears to have been somewhat handicapped by an early harvest.

vi. D. 43/38 (D. 14/34 x D. 165/34) deserves further investigation, but D. 14/37, which is of mediocre quality, and the other canes not mentioned above will be discarded.

TABLE III.—**Results of Plant Cane Variety Trials in Berbice and East and West Demerara.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre	
						Tons.	% Mean.
	Pln. Rose Hall, Field 16 B.T. Reaped 3.ix.42 at 11.75 months.						
MEANS OF 5 PLOTS:	D. 14/33	38.93	15.05	6.22	89.0	5.86	111.83
	D. 200/36	40.66	14.05	10.43	85.0	5.71	108.97
	P.O.J. 2878	38.68	13.98	7.15	87.9	5.41	103.24
	D. 166/34	39.34	13.54	7.64	87.9	5.33	101.72
	D. 54/38	41.68	11.94	9.96	84.0	4.98	95.04
	D. 194/35	31.71	15.39	5.13	90.2	4.88	93.13
	D. 174/35	32.40	13.96	6.44	88.3	4.52	86.26
	Mean:					5.24	100.00
	Significant Difference, 20 : 1 :					0.61	11.64
	Pln. Lusignan, Field 37 E. Reaped 17.vi.43 at 13,50 months.						
MEANS OF 5 PLOTS:	D. 166/34	31.54	14.26	4.70	90.5	4.50	161.29
	D. 14/37	28.01	12.17	5.98	88.2	3.41	122.22
	P.O.J. 2878	21.80	13.02	6.42	87.6	2.84	101.79
	D. 14/33	17.39	12.87	4.61	90.7	2.24	80.29
	D. 102/37	8.34	11.45	5.41	87.2	0.95	34.05
	Mean:					2.79	100.00
	Significant Difference, 20: 1:					0.39	13.98
	Pln. Providence (Dem.), Field 51/52 R.P. Reaped 9.xii.43 at 16.00 months.						
MEANS OF 5 PLOTS:	D.166/34	36.66	14.77	8.95	89.5	5.42	111.75
	D.43/38	34.29	13.62	7.34	92.4	4.67	96.29
	P.O.J.2878	32.00	13.97	8.55	91.9	4.47	92.16
	Mean:					4.85	100.00
	Significant Difference, 20 : 1 :					—	—
	Pln. Schoon Ord, Field 7 S. Reaped 2.ix.43 at 15.00 months.						
MEANS OF 5 PLOTS:	D. 166/34	40.33	13.89	4.64	89.8	5.60	115.46
	D. 14/37	36.75	13.97	4.49	89.7	5.13	105.77
	P.O.J. 2878	32.33	14.20	3.74	91.3	4.62	95.26
	D. 64/38	29.60	13.72	5.42	87.0	4.06	83.71
	Mean:					4.85	100.00
	Significant Difference, 20 : 1 :					0.69	14.28

SUB-SECTION B.—FIRST RATOON VARIETY TRIALS.

First Ratoon Variety Trials Reaped at Sophia Sugar Experiment Station.

Twelve first ratoon variety trials were harvested at the Sophia Sugar Experiment Station, and from Table IV. it will be seen that in regard to the first ratoon harvests:

i. Yields and quality were generally satisfactory.

ii. D. 14/33 (Co. 281 x Diamond 10) appeared thrice and surpassed the standard variety each time by statistically significant margins.

iii. D. 419/33 (Co. 281 x Diamond 10) outyielded P.O.J. 2878 in all four trials in which they met.

iv. D. 14/34 (Co. 281 x Diamond 10) led P.O.J. 2878 by statistically significant differences in all five trials in which they occurred together.

v. D. 166/34 (P.O.J. 2878 x Sorghum) was better than the standard cane in five out of the six comparisons made.

vi. D. 200/36 (P.O.J. 2878 x Co. 213) was distinctly superior to P.O.J. 2878 in both experiments in which they were compared.

vii. B. 34104 (Co. 281 x B.H. 10/12) was significantly better than P.O.J. 2878 in all of the six tests in which they met.

viii. Co. 419 (P.O.J. 2878 x Co. 290) and Co. 421 (P.O.J. 2878 x B. 3412) were both better than the standard variety in all the comparisons made.

ix. D. 61/36, D. 201/36, D. 1/37, D. 25/38, D. 38/38 and D. 43/38 show promise and merit further consideration.

The total yields for two crops are in close conformity with the findings from the first ratoon crops as summarised above, and show that there are several varieties superior to P.O.J. 2878.

TABLE IV.—Results of First Ratoon Variety Trials Reaped at Sophia Sugar Experiment Station.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.	Combined Results for 2 Crops, Plants and 1st Ratoons. Variety.	Combined Results for 2 Crops, Plants and 1st Ratoons. Sucrose in Cane per Acre, Tons.
		Sophia,	*Field*	*5 E.*	*Reaped*	*3.iii.43*	*at 12.25*	*months.*	
MEANS OF 5 PLOTS:	D. 201/36	30.62	14.43	5.73	87.3	4.42	127.75	Co. 421	9.63
	D. 1/37	31.94	13.53	6.13	87.4	4.32	124.86	D. 201/36	9.56
	Co. 421	32.41	13.22	5.12	87.6	4.29	123.99	B. 34104	9.33
	B. 34104	28.68	13.03	4.62	87.4	3.74	108.09	D. 14/34	9.02
	D. 14/34	24.52	14.63	5.27	89.8	3.59	103.76	D. 1/37	9.00
	Co. 419	24.61	13.38	5.81	88.9	3.28	94.80	D. 134/34	7.69
	D. 134/34	20.64	13.86	5.07	87.4	2.86	82.66	Co. 419	7.61
	P.O.J. 2878	20.72	13.78	6.36	88.2	2.86	82.66	D. 552/33	7.13
	D. 552/33	20.50	13.30	5.54	88.2	2.73	78.90	P.O.J. 2878	7.02
	D. 82/35	18.53	13.51	6.13	89.0	2.50	72.25	D. 82/35	6.92
	Mean:					3.46	100.00		
	Significant Difference, 20 : 1 :					0.78	22.54		
		Sophia,	*Field*	*8 E.*	*Reaped*	*17.ix.42*	*at 15.25*	*months.*	
MEANS OF 5 PLOTS:	D. 199/36	27.63	16.18	5.21	90.7	4.47	117.32	D. 199/36	8.58
	D. 14/34	25.70	17.05	3.88	93.4	4.38	114.96	Co. 419	8.16
	D. 419/33	25.28	16.04	4.69	90.7	4.05	106.30	D. 14/34	7.79
	Co. 419	22.24	16.06	5.42	89.9	3.57	93.70	D. 419/33	7.63
	P.O.J. 2878	16.99	15.15	5.40	89.7	2.57	67.45	P.O.J. 2878	5.73
	Mean:					3.81	100.00		
	Significant Difference, 20: 1:					0.79	20.73		
		Sophia,	*Field*	*9 E.*	*Reaped*	*18.iii.43*	*at 12.00*	*months.*	
MEANS OF 5 PLOTS:	D. 14/34	29.30	15.82	7.15	93.0	4.64	120.21	D. 14/34	10.49
	D. 1/37	33.84	13.69	7.09	89.9	4.63	119.95	B. 34104	9.58
	B. 34104	31.08	14.26	6.59	90.8	4.43	114.77	D. 1/37	9.27
	Co. 421	32.63	12.76	10.04	86.9	4.16	107.77	Co. 421	9.00
	D. 61/36	28.41	14.60	7.51	87.5	4.15	107.51	D. 134/34	8.91
	D. 134/34	26.94	14.52	7.56	89.7	3.91	101.30	D. 61/36	8.78
	D. 552/33	27.04	13.85	9.17	89.1	3.75	97.15	D. 552/33	8.52
	D. 226/35	23.27	14.17	8.27	89.8	3.30	85.49	D. 226/35	8.40
	D. 223/35	23.90	13.29	8.92	90.3	3.18	82.38	D. 82/35	7.98
	P.O.J. 2878	24.33	13.03	10.36	86.5	3.17	82.12	D. 223/35	7.28
	D. 82/35	21.63	14.52	8.71	90.6	3.14	81.35	P.O.J. 2878	6.51
	Mean:					3.86	100.00		
	Significant Difference, 20: 1:					0.80	20.73		
		Sophia,	*Field*	*11 E.*	*Reaped*	*29.iii.43*	*at 12.50*	*months.*	
MEANS OF 5 PLOTS:	B. 34104	30.51	13.79	6.24	91.2	4.21	124.19	Co. 421	9.13
	Co. 421	29.22	13.82	7.00	88.6	4.04	119.17	B. 34104	8.59
	Co. 419	26.76	13.29	7.55	87.6	3.55	104.72	D. 82/35	8.04
	D. 82/35	24.24	14.47	5.91	91.4	3.51	103.54	D. 552/33	7.50
	D. 166/34	23.61	13.52	6.69	87.0	3.19	94.10	D. 166/34	7.36
	D. 552/33	23.08	13.09	6.93	89.5	3.02	89.09	P.O.J. 2878	6.95
	D. 419/33	23.64	12.79	6.31	88.4	3.01	88.79	Co. 419	6.94
	P.O.J. 2878	20.39	12.64	5.86	87.6	2.58	76.11	D. 419/33	6.63
	Mean:					3.39	100.00		
	Significant Difference, 20: 1:					0.69	20.35		

TABLE IV (Contd.).—**Results of First Ratoon Variety Trials Reaped at Sophia Sugar Experiment Station.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined Results for 2 Crops, Plants and 1st Ratoons. Variety.	Sucrose in Cane per Acre Tons.
		Sophia, Field 12 E. "A." Reaped 11.xi. 43 at 12 50 months.							
MEANS OF 5 PLOTS:	D. 200/36	35.78	15.42	4.01	91.6	5.52	132.69	D. 200/36	11.58
	D. 25/38	31.46	14.20	4.49	89.0	4.47	107.5	D. 25/38	10.57
	D. 27/38	31.97	13.66	7.20	87.7	4.37	105.05	D. 28/38	9.16
	D. 28/38	26.37	15.53	3.89	90.8	4.14	99.52	D. 14/33	8.73
	D. 14/33	27.55	15.03	3.98	92.0	4.14	99.52	D. 27/38	8.45
	D. 1/37	26.26	13.83	4.37	88.5	3.63	87.26	D. 1/37	8.07
	P.O.J. 2878	22.08	15.89	4.49	90.4	3.51	84.37	P.O.J. 2878	7.75
	D. 166/34	21.31	16.36	4.65	92.2	3.49	83.89	D. 166/34	7.43
	Mean:					4.16	100.00		
	Significant Difference, 20 : 1:					0.70	16.83		
	Sophia, Field 12 E. "B." Reaped 11.xi.43 at 12.50 months.								
MEANS OF 5 PLOTS:	D. 38/38	31.38	15.84	5.53	92.2	4.97	120.05	D.38/38	9.19
	D. 43/38	28.77	16.07	5.52	91.9	4.62	111.59	D.43/38	8.83
	D. 166/34	25.78	16.38	5.17	91.6	4.22	101.93	D.166/34	8.45
	P.O.J. 2878	24.75	14.76	6.49	88.2	3.65	88.16	P.O.J.2878	6.77
	D. 2/38	21.14	15.43	6.17	92.2	3.26	78.74	D.2/38	6.68
	Mean:					4.14	100.00		
	Significant Difference, 20 : 1:					0.93	22.46		
	Sophia, Field 13 E. "A." Reaped 29.x.43 at 12.25 months.								
MEANS OF 5 PLOTS:	D. 14/33	30.29	16.22	6.49	92.2	4.91	123.06	D. 25/38	10.30
	D. 25/38	31.96	13.34	7.09	92.9	4.26	106.77	D.14/33	9.91
	D. 201/36	30.71	13.23	8.65	85.7	4.06	101.75	D.27/38	9.26
	D. 27/38	31.61	11.74	5.84	87.4	3.71	92.98	D.201/36	9.05
	D. 166/34	23.77	15.23	7.25	89.5	3.62	90.73	D.166/34	8.52
	P.O.J. 2878	23.53	14.27	6.01	87.5	3.36	84.21	P.O.J. 2878	8.00
	Mean:					3.99	100.00		
	Significant Difference, 20 : 1:					0.50	12.53		
	Sophia, Field13 E. "B." Reaped 29.x.43 at 12.25 months.								
MEANS OF 5 PLOTS	B. 34104	32.27	15.59	5.78	92.4	5.03	120.91	B. 34104	9.62
	D. 166/34	27.01	15.47	7.78	90.6	4.18	100.48	D. 166/34	8.79
	D. 82/35	26.43	15.24	5.95	91.4	4.03	96.87	D. 82/35	8.47
	P.O.J 2878	26.50	15.07	6.13	91.7	3.99	95.91	D. 134/34	8.45
	D. 134/34	24.43	14.55	6.24	90.7	3.55	85.34	P.O.J. 2878	7.25
	Mean:					4.16	100.00		
	Significant Difference. 20 : 1:					0.69	16.59		
	Sophia, Field 15 E. Reaped 10. ix.42. at 14.75 months.								
MEANS OF 5 PLOTS:	Co. 421	39.57	14.65	8.09	87.8	5.80	137.12	Co. 421	12.82
	D. 14/34	34.40	15.39	4.60	91.4	5.29	125.06	D. 14/34	9.60
	D. 419/33	31.33	14.14	5.48	90.3	4.43	104.73	D. 552/33	8.66
	D. 552/33	30.36	14.23	7.30	88.3	4.32	102.13	B. 3013	8.60
	P.O.J. 2878	26.06	13.07	7.62	85.5	3.41	80.61	P.O.J. 2878	8.42
	B. 3013	24.05	14.14	6.49	89.5	3.40	80.38	D. 419/33	7.76
	D. 335/36	27.98	10.63	17.83	78.4	2.97	70.21	D. 335/36	7.51
	Mean:					4.23	100.00		
	Significant Difference, 20 : 1:					0.99	23.40		

TABLE IV (Contd.).—**Results of First Ratoon Variety Trials Reaped at Sophia Sugar Experiment Station.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre,		Combined Results for 2 Crops, Plants and 1st Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
		Sophia, Field 16 E. Reaped 19.x.43 at					*13.25 months.*		
MEANS OF 5 PLOTS:	D. 166/34	32.47	15.00	5.71	90.0	4.87	118.49	B. 34104	10.84
	B. 34104	34.09	13.99	7.31	90.3	4.77	116.06	D. 166/34	9.61
	D. 134/34	29.47	14.73	6.88	90.4	4.34	105.60	D. 419/33	9.41
	D. 419/33	30.43	13.40	7.73	85.8	4.08	99.27	D. 1/37	9.30
	D. 1/37	28.97	13.79	5.53	89.5	4.00	97.32	D. 134/34	8.72
	P.O.J. 2878	24.95	13.61	7.91	86.2	3.40	82.72	P.O.J. 2878	7.91
	D. 226/35	23.25	14.28	6.66	88.9	3.32	80.78	D. 226/35	7.31
	Mean:					4.11	100.00		
	Significant Difference, 20 : 1 :					0.85	20.68		
		Sophia, Field 7 W. Reaped 21.xi.42 at					*12.00 months.*		
MEANS OF 4 PLOTS:	D. 200/36	26.96	14.91	5.74	90.8	4.02	120.36	Co. 421	7.50
	Co. 421	27.63	14.19	5.12	89.2	3.92	117.37	D. 200/36	7.13
	D. 14/33	22.45	15.75	3.85	92.5	3.54	105.99	D. 14/33	6.82
	D. 14/34	21.07	15.44	3.99	92.6	3.25	97.31	D. 14/34	6.55
	D. 1/37	21.07	13.36	4.69	90.4	2.81	84.13	D. 1/37	5.89
	P.O.J. 2878	16.96	14.87	5.59	91.5	2.52	75.45	P.O.J. 2878	5.19
	Mean:					3.34	100.00		
	Significant Difference, 20 : 1 :					0.57	17.07		
		Sophia, Field 16 W. Reaped 20.xi.43 at					*14.50 months.*		
MEANS OF 5 PLOTS:	B. 34104	28.81	13.03	6.35	87.5	3.75	114.33	B. 34104	8.68
	P.O.J. 2878	20.41	15.75	6.33	91.6	3.22	98.17	D. 81/35	7.83
	D. 81/35	20.75	13.81	6.93	88.5	2.87	87.50	P.O.J. 2878	7.55
	Mean:					3.28	100.00		
	Significant Difference, 20 : 1 :					0.52	15.85		

FIRST RATOON VARIETY TRIALS REAPED IN BERBICE.

Only one first ratoon variety test was harvested in Berbice during the period, and data from it appear in Table V. It is clear that all three of the Demerara seedlings tested have proved themselves much superior to P.O.J. 2878 both as first ratooners and in total yield for two crops.

TABLE V.— **Results of First Ratoon Variety Trial Reaped in Berbice.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre.		Combined Results for 2 Crops, Plants and 1s' Ratoons.	
						Tons.	% Mean.	Variety.	Sucrose in Cane per Acre, Tons.
	Pln.	*Rose*	*Hall.*	*Field*	*16 B. T.*	*Reaped*	*21.ix.43*	*at*	*12.50* *months.*
MEANS OF 5 PLOTS:	D. 14/33	26.51	16.07	6.55	92.2	4.26	113.60	D. 14/33	10.12
	D. 166/34	27.18	15.63	7.87	89.2	4.25	113.33	D. 166/34	9.58
	D. 200/36	26.64	14.44	9.39	86.9	3.85	102.67	D. 200/36	9.56
	P.O.J. 2878	20.02	13.16	10.16	85.6	2.63	70.13	P.O.J. 2878	8.04
	Mean:					3.75	100.00		
	Significant Difference, 20 : 1 :					0.68	18.13		

FIRST RATOON VARIETY TRIALS REAPED IN EAST DEMERARA.

Six first ratoon variety experiments were harvested in East Demerara, and the results are presented in Table VI. Yields were somewhat disappointing generally, and the quality of the cane was poor at Enmore where the test was not reaped until it was fourteen months of age. It may be noted that:—

i. D. 419/33 (Co. 281 x Diamond 10) was significantly better than P.O.J. 2878 at Enmore in the single comparison made, and leads by a wide margin in total yield for two crops.

ii. Both as a first ratoon and in total yield for two crops, D. 14/34 (Co. 281 x Diamond 10) was significantly better than the standard in both tests in which they met.

iii. D. 166/34 (P.O.J. 2878 x Sorghum) met P.O.J. 2878 twice and surpassed it on each occasion.

iv. Co. 419 (P.O.J. 2878 x Co. 290) was disappointing at Lusignan, but Co. 421 (P.O.J. 2878 x B. 3412) outyielded the standard as first ratoon in four out of the five tests in which they met, and was consistently above it in total yield for two crops.

TABLE VI.—Results of First Ratoon Variety Trials Reaped in East Demerara.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.	Combined Results for 2 Crops, Plants and 1st Ratoons. Variety.	Combined Results for 2 Crops, Plants and 1st Ratoons. Sucrose in Cane per Acre, Tons.
	Pln. Enmore, Field 14 E.E. Reaped 16.vii.43 at						*14.00 months.*		
MEANS OF 5 PLOTS:	Co. 421	31.16	11.37	7.92	83.9	3.54	114.56	Co. 421	8.33
	D. 419/33	28.64	11.49	8.75	82.1	3.29	106.47	D. 419/33	7.57
	Co. 419	26.87	11.73	7.44	84.0	3.15	101.94	D. 166/34	7.44
	D. 166/34	25.76	11.44	7.92	82.3	2.95	95.47	P.O.J. 2878	6.62
	P.O.J. 2878	21.31	11.95	8.35	83.7	2.54	82.20	Co. 419	6.29
	Mean:					3.09	100.00		
	Significant Difference, 20: 1:					0.62	20.06		
	Pln. Lusignan, Field 17 G.H. Reaped 21.iv.43 at						*12.75 months.*		
MEANS OF 5 PLOTS:	D. 14/34	26.10	16.31	3.61	91.4	4.26	128.70	D. 14/34	10.02
	Co. 421	23.85	13.51	4.38	86.9	3.22	97.28	Co. 421	7.76
	P.O.J. 2878	20.01	14.69	4.27	87.8	2.94	88.82	P.O.J. 2878	7.01
	Co. 419	18.70	15.07	4.32	87.3	2.82	85.20	Co. 419	6.67
	Mean:					3.31	100.00		
	Significant Difference, 20: 1:					0.52	15.71		
	Pln. Ogle, Field 29 L. Reaped 16.iv.43 at 13.00 months.								
MEANS OF 5 PLOTS:	Co. 421	34.03	13.92	4.30	89.4	4.74	130.94	Co. 421	12.30
	D. 14/34	28.31	14.91	3.64	88.7	4.22	116.57	D. 14/34	12.16
	P.O.J. 2878	24.80	12.55	5.42	86.5	3.11	85.91	P.O.J. 2878	9.07
	D. 552/33	16.73	14.33	4.46	88.7	2.40	66.30	D. 552/33	8.28
	Mean:					3.62	100.00		
	Significant Difference, 20: 1:					0.46	12.71		
	Pln. Providence, Field 42 Rp. Reaped 23.vi.42 at 13.25 months.								
MEANS OF 5 PLOTS:	D. 166/34	33.61	14.58	7.06	88.5	4.90	101.87	D. 166/34	10.93
	P.O.J. 2878	35.86	13.15	9.33	86.8	4.72	98.13	P.O.J. 2878	10.75
	Mean:					4.81	100.00		
	Significant Difference, 20: 1:					—	—		
	Pln. Providence, Field 77 P.H. Reaped 30.iii..43 at 12.50 months.								
MEANS OF 5 PLOTS:	D. 552/33	26.26	15.44	6.47	89.8	4.05	114.41	D. 552/33	9.96
	P.O.J. 2878	23.26	14.44	7.16	88.3	3.36	94.92	Co. 421	9.52
	Co. 421	22.90	14.01	7.54	85.5	3.22	90.96	P.O.J. 2878	9.02
	Mean:					3.54	100.00		
	Significant Difference, 20: 1:					0.39	11.02		
	Pln. Farm, Field 9/11 H.P. Reaped 12.vi.43 at 13.50 months.								
MEANS OF 5 PLOTS:	Co. 421	32.18	14.59	5.50	90.1	4.70	133.90	Co. 421	11.29
	P.O.J. 2878	15.72	14.82	4.66	90.2	2.33	66.38	P.O.J. 2878	7.45
	Mean:					3.51	100.00		
	Significant Difference, 20: 1:					0.82	23.36		

FIRST RATOON VARIETY TRIALS REAPED IN WEST DEMERARA.

The results of the three first ratoon variety experiments harvested in West Demerara appear in Table VII. Apart from D. 166/34 (P.O.J. 2878 x Sorghum) which was outstanding at Wales, the other seedlings have all been discarded.

TABLE VII.—**Results of First Ratoon Variety Trials Reaped in West Demerara.**

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.	Combined Results for 2 Crop, Plants and 1st Ratoons. Variety.	Combined Results for 2 Crop, Plants and 1st Ratoons. Sucrose in Cane per Acre, Tons.
		Pln.	*Wales,*	*Field*	*27 L.*	*Reaped*	*23.xi.42*	*at 12.75*	*months.*
MEANS OF 5 PLOTS :	D. 166/34	36.02	15.40	8.36	91.9	5.55	117.83	D. 166/34	13.91
	P.O.J. 2878	32.12	14.70	6.12	91.2	4.72	100.21	P.O.J. 2878	10.87
	D.49/37	28.18	13.74	8.36	89.5	3.87	82.17	D. 49/37	10.53
	Mean :					4.71	100.00		
	Significant Difference. 20 : 1 :					0.95	20.17		
		Pln. Le	*onora,*	*Field*	*83 L.*	*Reaped*	*20.viii.*	*42 at 11.75*	*months.*
MEANS OF 5 PLOTS :	P.O.J. 2878	31.83	14.40	11 66	88.5	4.58	115.37	P.O.J. 2878	10.08
	D. 79/36	28.47	12.92	17.30	81.6	3.68	92.70	D. 10/36	8.79
	D. 10/36	23.66	15.38	13.39	89.1	3.64	91.69	D. 79/36	8.65
	Mean :					3.97	100.00		
	Significant Difference, 20 : 1 :					—	—		
		Pln. Le	*onora,*	*Field*	*61 Sv.*	*Reaped*	*27.viii.*	*42 at 12.00*	*months.*
MEANS OF 5 PLOTS :	D. 79/36	24.20	11.81	19.57	80.5	2.86	107.52	D. 10 36	7.27
	D. 10/36	20.53	13.59	12.56	87.9	2.79	104.89	D. 79/36	7.01
	P.O.J. 2878	19.43	11.97	14.71	84.7	2.33	87.59	P O.J. 2878	5.13
	Mean :					2.66	100.00		
	Significant Difference, 20 : 1 :					—	—		

SUB-SECTION C.—SECOND RATOON VARIETY TRIALS.

SECOND RATOON VARIETY TRIALS REAPED AT SOPHIA SUGAR EXPERIMENT STATION.

Data from the six second ratoon variety experiments harvested at the Sophia Sugar Experiment Station appear in Table VIII. Yields were low in Fields 8 E. and 7 W., but satisfactory elsewhere, while the cane quality was generally good. It is clear from the results that P.O.J. 2878 cannot compete with D. 14/34 (Co. 281 x Diamond 10), D. 200/36 (P.O.J. 2878 x Co. 213), Co. 419 (P.O.J. 2878 x Co. 290) or Co. 421 (P.O.J. 2878 x B. 3412) in second ratoons or in total yield for three crops, and that D. 14/33 and D. 419/33 (both Co. 281 x Diamond 10) have also given promising results.

TABLE VIII.—Results of Second Ratoon Variety Trials Reaped at Sophia Sugar Experiment Station.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Purity.	Sucrose in Cane per Acre. Tons.	Sucrose in Cane per Acre. % Mean.	Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons. Variety.	Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons. Sucrose in Cane per Acre Tons.
		Sophia,	*Field*	*2 E.*	*Reaped*	*18.ix.42*	*at 15.50*	*months.*	
MEANS OF 5 PLOTS :	D. 14/34	29.44	15.95	5.95	88.9	4.70	117.21	D. 14/34	9.59
	D. 199/36	29.81	15.22	6.66	88.3	4.54	113.22	D. 199/36	9.27
	Co. 419	28.73	14.87	6.91	85.3	4.27	106.48	Co. 4 9	3.88
	D. 419/33	24.01	15.40	6.09	86.8	3.70	92.27	D. 419/33	7.80
	P.O.J. 2878	19.48	14.51	6.83	85.8	2.83	70.57	P.O.J. 2878	6.31
	Mean :					4.01	100.00		
	Significant Difference, 20 : 1 :					0.76	18.95		
		Sophia,	*Field*	*8 E.*	*Reaped*	*2.ix.43*	*at 11.50*	*months.*	
MEANS OF 5 PLOTS :	Co. 419	21.64	16.28	4.32	92.5	3.52	116.94	Co. 419	11.68
	D. 14/34	19.72	16.23	4.90	92.8	3.20	106.31	D. 14/34	10.99
	D. 419/33	20.50	15.29	4.80	91.6	3.13	103.99	D. 419/33	10.76
	P.O.J. 2878	15.87	13.87	6.06	88.3	2.20	73.09	P.O.J. 2878	7.93
	Mean :					3.01	100.00		
	Significant Difference, 20 : 1 :					0.55	18.27		
		Sophia,	*Field*	*15 E.*	*Reaped*	*21.x.43*	*at 13.25*	*months.*	
MEANS OF 5 PLOTS :	Co. 421	31.82	16.50	6.17	88.0	5.25	128.68	Co. 421	18.07
	D. 14/34	24.65	17.40	4.68	93.0	4.29	105.15	D. 14/34	13.90
	D. 419/33	22.51	15.72	6.10	89.3	3.54	86.76	P.O.J. 2878	11.66
	P.O.J. 2878	20.46	15.81	5.78	91.7	3.24	79.41	D. 419/33	11.30
	Mean :					4.08	100.00		
	Significant Difference, 20 : 1 :					0.77	18.87		
		Sophia,	*Field*	*5 W.*	*Reaped*	*6.xi.42*	*at 12.25*	*months.*	
MEANS OF 5 PLOTS :	D. 14/34	25.38	17.14	4.62	92.6	4.35	135.94	D. 14/34	13.92
	D. 199/36	19.90	14.91	8.98	87.7	2.97	92.81	D. 199/36	10.51
	P.O.J. 2878	16.09	14.15	7.10	87.2	2.28	71.25	P.O.J. 2878	8.71
	Mean :					3.20	100.00		
	Significant Difference, 20 : 1 :					0.75	23.44		
		Sophia,	*Field*	*7 W.*	*Reaped*	*23.xi.43*	*at 12.25*	*months.*	
MEANS OF 4 PLOTS :	Co. 421	17.62	14.79	7.22	91.4	2.60	115.04	Co. 421	10.10
	D. 14/34	15.77	16.13	4.02	93.0	2.54	112.39	D. 200/36	9.54
	D. 1/37	17.14	14.53	4.93	89.8	2.49	110.18	D. 14/34	9.09
	D. 200/36	16.04	15.03	6.39	90.6	2.41	106.64	D. 14/33	9.00
	D. 14/33	13.70	15.92	7.12	92.9	2.18	96.46	D. 1/37	8.38
	P.O.J. 2878	9.79	13.62	10.06	89.6	1.33	58.85	P.O.J. 2878	6.52
	Mean :					2.26	100.00		
	Significant Difference, 20 : 1 :					0.66	29.20		
		Sophia	*Field*	*12 W.*	*Reaped*	*3.xi.42*	*at 12.50*	*months.*	
MEANS OF 5 PLOTS :	D. 200/36	25.13	16.30	4.08	92.3	4.10	116.81	D. 200/36	12.74
	P.O.J. 2878	19.17	15.31	4.09	91.1	2.93	83.48	P.O.J. 2878	7.91
	Mean :					3.51	100.00		
	Significant Difference, 20 : 1 :					0.71	20.23		

SECOND RATOON VARIETY TRIALS REAPED IN BERBICE AND DEMERARA.

Seven second ratoon variety tests were harvested during the period and Table IX shows the results obtained. Yields were good, except at Providence, Demerara, where they were distinctly poor. Cane quality was satisfactory. The following points may be noted:—

i. At Uitvlugt, D. 14/33 (Co. 281 x Diamond 10) was much better than P.O.J. 2878 both in tonnage and quality.

ii. At Blairmont, D. 419/33 (Co. 281 x Diamond 10) outyielded the standard as a second ratoon but is behind in total yield for three crops because of a very unfavourable start as plants.

iii. In the three tests in which each appeared, D. 166/34 (P.O.J. 2878 x Sorghum) and Co. 419 (P.O.J. 2878 x Co. 290) were superior to P.O.J. 2878 both as second ratoons and in total yield for three crops. In the case of Co. 419, all the yield differences were statistically significant.

TABLE IX.—Results of Second Ratoon Variety Trials Reaped in Berbice, East and West Demerara.

	Variety.	Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio	Purity.	Sucrose in Cane per Acre, Tons.	Sucrose in Cane per Acre, % Mean.	Combined Results for 3 Crops, Plants, 1st and 2nd Ratoons. Variety.	Sucrose in Cane per Acre, Tons.
	Pln. Blairmont, Field 13 R. Reaped 8.viii.42 at 11.75 months.								
MEANS OF 5 PLOTS:	Co. 419	35.10	16.04	5.47	92.3	5.63	133.10	Co. 419	20.21
	D. 419/33	24.75	14.89	8.11	91.5	3.69	87.23	P.O.J. 2878	13.29
	P.O.J. 2878	22.06	15.82	7.11	91.9	3.38	79.91	D. 419/33	12.18
	Mean:					4.23	100.00		
	Significant Difference, 20: 1:					0.82	19.39		
	Pln. Blairmont, Field 9 B.L. Reaped 25.v.43 at 13.25 months.								
MEANS OF 5 PLOTS:	Co. 419	22.68	14.30	6.59	86.9	3.24	120.00	Co. 419	15.06
	P.O.J. 2878	14.69	14.76	6.12	87.5	2.17	80.37	P.O.J. 2878	13.30
	Mean:					2.70	100.00		
	Significant Difference, 20: 1:					0.94	34.81		
	Pln. Bath, Field 10 L. Reaped 18.xii.42 at 13.00 months.								
MEANS OF 5 PLOTS:	D. 166/34	29.60	15.80	5.10	91.6	4.68	114.43	D. 166/34	13.13
	P.O.J. 2878	25.72	13.59	6.19	86.3	3.50	85.57	P.O.J. 2878	9.69
	Mean:					4.09	100.00		
	Significant Difference, 20: 1:					0.59	14.43		
	Pln. La Bonne Intention, Field 27 V.S. Reaped 1.ix.42 at 12.25 months.								
MEANS OF 5 PLOTS:	Co. 419	25.91	13.69	6.20	88.0	3.55	110.59	Co. 419	10.00
	P.O.J. 2878	22.24	12.94	8.35	85.4	2.88	89.72	P.O.J. 2878	7.24
	Mean:					3.21	100.00		
	Significant Difference, 20: 1:					0.51	15.89		
	Pln. Ogle, Field 40 I. Reaped 23.ix.42 at 12.25 months.								
MEANS OF 5 PLOTS:	D.166/34	33.01	14.50	8.21	87.8	4.79	118.27	D.166/34	14.93
	P.O.J. 2878	26.19	12.67	7.74	87.6	3.32	81.98	P.O.J. 2878	12.61
	Mean:					4.05	100.00		
	Significant Difference, 20: 1:					0.59	14.57		
	Pln. Providence, Dem., Field 42 R.P. Reaped .xii.43 at 12.50 months.								
MEANS OF 5 PLOTS:	D. 166/34	12.86	14.04	9.16	89.9	1.81	107.10	D. 166/34	2.74
	P.O.J. 2878	12.77	12.32	9.62	88.1	1.57	92.90	P.O.J. 2878	2.32
	Mean:					1.69	100.00		
	Significant Difference, 20: 1:					0.20	11.83		
	Pln. Ulvlugt, Field 31 W. Reaped 16.xii.42 at 12.25 months.								
MEANS OF 5 PLOTS:	D. 14/33	40.34	15.16	5.70	89.4	6.12	113.97	D. 14/33	2.93
	P.O.J. 2878	34.01	13.60	8.52	88.6	4.03	86.22	P.O.J. 2878	6.57
	Mean:					5.37	100.00		
	Significant Difference, 20: 1:					—	—		

SUB-SECTION D.—DISCUSSION AND SUMMARY.

In Table X the mean sucrose yields of all canes in all the experiments harvested to date are compared with that of the standard, P.O.J. 2878, and in Table XI certain data, indicative of cane quality, are compared for some of the varieties.

TABLE X.—**General Mean Sucrose Yields in Tons per Acre from All Experiments.**

Variety.	Plants.		First Ratoons.		Second Ratoons.		Total Yield.	Total Yield, P.O.J. 2878 = 100.00
	Yield.	No. of Expts.	Yield.	No. of Expts.	Yield.	No. of Expts.		
	Three	*Crops,*	*Plants,*	*First*	*and*	*Second*	*Ratoons.*	
D. 200/38	5.75	5	6.08	4	5.01	2	16.84	144.67
Co. 421	5.77	10	5.42	10	5.63	2	16.82	144.50
D. 14/34	5.93	9	5.48	10	5.27	5	16.68	143.30
D. 1/37	5.63	8	4.70	5	6.14	1	16.47	141.49
D. 14/33	5.54	10	5.28	5	4.57	2	15.39	132.22
D. 199/36	4.76	9	5.21	3	4.82	2	14.79	127.06
Co. 419	5.07	9	4.63	10	4.83	6	14.53	124.83
D. 166/34	5.38	27	4.40	16	4.20	6	13.98	120.10
D. 419/33	4.50	9	5.03	10	4.20	7	13.73	117.96
D. 552/33	4.99	10	4.22	8	3.38	1	12.59	108.16
P.O.J. 2878	**4.61**	—	**3.75**	—	**3.28**	—	**11.64**	**100.00**
	Two	*Crops,*	*Plants*	*and*	*First*	*Ratoons.*		
D. 61/36	6.57	2	4.91	1	—	—	11.48	137.32
D. 38/38	6.24	1	5.11	1	—	—	11.35	135.77
D. 25/38	6.30	2	4.77	2	—	—	11.07	132.42
B. 34104	5.95	9	5.06	6	—	—	11.01	131.70
D. 201/36	5.22	3	5.11	2	—	—	10.33	123.56
D. 43/38	5.39	2	4.75	1	—	—	10.14	121.29
D. 174/35	4.19	3	5.72	1	—	—	9.91	118.54
D. 23/38	5.46	1	4.42	1	—	—	9.88	118.18
D. 82/35	5.51	6	4.11	5	—	—	9.62	115.07
D. 134/34	5.41	6	4.10	4	—	—	9.51	113.76
D. 223/35	5.66	1	3.76	1	—	—	9.42	112.68
D. 27/38	5.00	2	4.41	2	—	—	9.41	112.56
D. 226/35	5.35	3	3.78	2	—	—	9.13	109.21
D. 10/36	5.35	2	3.49	2	—	—	8.84	105.74
D. 79/36	5.05	4	3.55	2	—	—	8.60	102.87
P.O.J. 2878	**4.61**	—	**3.75**	—	—	—	**8.36**	**100.00**
B. 3013	4.59	2	3.74	1	—	—	8.33	99.64
D. 81/35	4.73	3	3.34	1	—	—	8.07	96.53
D. 49/37	4.99	1	3.07	1	—	—	8.06	96.41
D. 2/38	4.57	2	3.35	1	—	—	7.92	94.74
D. 335/36	4.18	1	3.27	1	—	—	7.45	89.11
D. 194/35	2.90	4	2.85	1	—	—	3.23	82,56
		One	*Crop,*	*Plants*	*only.*			
D. 33/37	5.63	1	—	—	—	—	—	122.13
D. 51/38	5.61	1	—	—	—	—	—	121.69
D. 143/35	5.21	4	—	—	—	—	—	113.02
D. 14/37	5.16	4	—	—	—	—	—	111.93
D. 23/37	5.04	1	—	—	—	—	—	109.33
D. 75/35	5.03	5	—	—	—	—	—	109.11
D. 80/37	4.92	1	—	—	—	—	—	106.72
D. 81/37	4.91	2	—	—	—	—	—	106.51
D. 54/38	4.72	2	—	—	—	—	—	102.39
D. 64/38	4.65	2	—	—	—	—	—	100.87
P.O.J. 2878	**4.61**	—	—	—	—	—	—	**100.00**
D. 52/38	4.44	1	—	—	—	—	—	96.31
D. 50/37	4.38	2	—	—	—	—	—	95.01
D. 132/35	4.33	1	—	—	—	—	—	93.93
D. 172/35	4.31	1	—	—	—	—	—	93.49
D. 120/37	3.82	2	—	—	—	—	—	82.86
D. 216/36	3.61	2	—	—	—	—	—	78.31
D. 96/37	3.59	1	—	—	—	—	—	77.87
D. 143/37	3.41	1	—	—	—	—	—	73.97
D. 80/35	3.07	1	—	—	—	—	—	66.59
D. 20/37	2.98	1	—	—	—	—	—	33.41
D. 102/37	1.54	1						

TABLE XI.— **The Quality of the Most Promising Seedlings as Compared with P.O.J. 2878.**

Variety.	Pol % Cane.		Juice Purity.		Glucose Ratio.		Fibre % Cane.	
	% of P.O.J. 2878.	No. of Comparisons.	% of P.O.J. 2878.	No. of Comparisons.	% of P.O.J. 2878.	No. of Comparisons.	% of P.O.J. 2878.	No. of Comparisons.
D. 14/33	109.22	17	103.18	17	75.66	17	111.24	15
D. 419/33	100.68	23	99.88	23	99.85	23	118.84	17
D. 14/34	111.57	24	103.73	24	73.55	24	109.45	22
D. 166/34	104.87	43	101.71	43	96.29	43	98.32	39
D. 61/36	107 79	3	101.65	3	91.99	3	—	—
D. 200/36	102.96	11	100.48	11	96.91	11	110.67	11
D. 201/36	98.17	5	98.08	5	125.29	5	—	—
D. 1/37	96.05	14	100.22	14	89.45	14	101.92	8
D. 25/38	97.90	4	101.19	4	83.81	4	126.04	1
D. 38/38	113.26	2	103.75	2	79.09	2	—	—
B. 34104	102.88	15	102.40	15	89.22	15	104.62	13
Co. 419	100.42	25	99.90	25	97.15	25	97.23	22
Co. 421	101.00	22	100.64	22	89.79	22	119.04	22
P.O.J. 2878	100.00	—	100.00	—	100.00	—	100.00	—

In the last Bulletin of this series, Planters were advised to extend and test commercially D. 14/33, D. 419/33, D. 14/34, D. 166/34, Co. 419 and Co. 421. The experiments recorded here confirm the previous findings and justify the advice given; they indicate clearly that considerable increases may be expected in the average and the total crop of the Colony if these canes are rapidly extended. D. 14/33, D. 14/34 and Co. 421 are particularly striking, but D. 419/33, D. 166/34 and Co. 419 have also outyielded P.O.J. 2878 by wide margins and should not be neglected. Many fields of these canes are now to be seen throughout the Colony and their appearance confirms the experimental results.

The extension of these six varieties should be accelerated so that their higher yields may make a definite contribution to the survival of the Industry in the period of post-war competition and D. 14/33, D. 14/34, D. 166/34 and Co. 421, especially, should constitute the bulk, if indeed not the whole, of the plantings in the immediate future. D. 14/34 (Co. 281 x Diamond 10) is particularly promising for it not only produces heavy crops of high quality cane but it is an excellent ratooner and a light arrower.

Two other canes have been sufficiently tested and have performed sufficiently well to merit distribution for nurseries. They are D. 200/36 (P.O.J. 2878 x Co. 213) and B. 34104 (Co. 281 x B.H. 10/12) and estates are advised to establish and extend nurseries of these seedlings without delay. They both yield heavy crops of cane and ratoon well. The cane from these two seedlings is of similar quality and they are both superior to P.O.J. 2878 in that respect. So far, B. 34104 has been slightly better than D. 200/36 as a plant, while the latter has excelled the Barbados cane in ratooning.

D. 61/36 (49/30 x Diamond 10), D. 201/36 (P.O.J. 2878 x Co. 213), D. 1/37 (P.O.J. 2878 x Co. 281), D. 25/38 (Co. 421 x Diamond 10), D. 38/38 (P.O.J. 2878 x D. 145) and D. 51/38 (P.O.J. 2878 x Co. 213) show much promise but must be tested further.

D. 552/33, although generally superior to P.O.J. 2878, is unlikely to compete successfully against D. 14/34 and has been discarded.

D. 33/37, which heads the one-crop section of Table X, yields poor quality cane and has also been discarded.

No further work will be done with the canes below D. 43/38 in the two-crop section of Table X, or below D. 51/38 in the one-crop section.

MANURIAL TRIALS.

The results of sixty-one manurial trials, reaped during the period under review, are presented in six sub-sections, *viz.*,

A—Nitrogenous manures,

B—Phosphatic manures,

C—Potassic manures,

D—Liming materials,

E—Organic manures,

F—Discussion and summary.

Many of the experiments were of a complex or factorial nature, involving dressings of more than one element. The response to each element is discussed under the appropriate sub-section.

SUB-SECTION A.—NITROGENOUS MANURES.

(A 1—A 6) Various Sources of Nitrogen on Flood-Fallowed Frontland.

Fields 7 S.G., Skeldon; 6 A., Albion; 9 E.B., Providence, B.; 16 E.E., Enmore; 61 V.S., La Bonne Intention; and 57 I., Ogle.

Table XII presents the plant cane results from six tests carried out under a scheme financed by the Chilean Nitrate Corporation. Yields were satisfactory at five sites but poor at Providence, Berbice, where, on the other hand, cane quality was best.

There was some fluctuation in the order of merit of the various formulae from site to site but, in general :

i. Sodium nitrate has not proved as satisfactory as ammonium sulphate;

ii. Sodium nitrate with ammonium sulphate has been better than the former alone but not as good as the latter alone;

iii. There has been no significant difference between the effect of ammonium sulphate alone, or with one ton of limestone, and that of calcium cyanamide, although, as in several other tests reported on in this Bulletin, there has been a tendency for calcium cyanamide to give slightly lower yields;

iv. The fertilizers have had no marked differential effects on cane quality.

TABLE XII.—Effect of Various Sources of Nitrogen on Plant Canes on Flood-fallowed Frontland.

Treatments per Acre.	Skeldon, Field 7 S.G. P.O.J. 2878.	Albion, Field 6 A. Co. 419.	Providence B., Field 9 E.B. P.O.J. 2878.	Enmore, Field 16 E.E. Co. 419.	L.B.I., Field 61 V.S. Diamond 10.	Ogle, Field 57 I. Diamond 10.	Mean of Six Tests.
			Mean Yield in Tons Cane per Acre.				
No Manure	48.38	46.39	19.29	33.15	44.42	37.32	38.16
Amm. Sulph., 2 Cwt.	44.72	47.90	22.05	37.44	49.83	41.32	40.54
" " 2 "	50.68	47.90	23.38	37.25	50.27	39.46	41.49
Limestone, 1 Ton							
Cyanamide, 2 Cwt.	48.09	45.31	23.34	36.44	49.39	37.84	40.07
Sodium Nitrate, 2.69 "	48.15	46.83	19.24	33.06	48.53	36.52	38.72
" " 1.35 "	47.10	46.07	22.29	34.62	48.16	40.68	39.82
Amm. Sulph., 1 "							
Sig. Diff., 20:1	—	—	2.92	—	—	—	1.90
			Mean Pol % Cane.				
No Manure	12.02	11.51	15.93	13.51	12.74	13.75	13.25
Amm. Sulph., 2 Cwt.	12.15	11.73	15.52	15.04	13.40	13.78	13.60
" " 2 "	11.87	11.36	15.79	15.37	13.22	14.38	13.67
Limestone, 1 Ton							
Cyanamide, 2 Cwt.	11.76	11.51	15.45	15.66	13.24	14.22	13.64
Sodium Nitrate, 2.69 "	12.07	11.05	15.42	15.28	13.64	14.50	13.66
" " 1.35 "	11.83	11.78	15.17	15.37	13.60	14.88	13.77
Amm. Sulph., 1 "							
Sig. Diff., 20:1	—	—	—	1.18	—	0.68	0.33
			Mean Glucose Ratio.				
No Manure	8.76	11.64	6.11	5.60	8.61	10.07	8.47
Amm. Sulph., 2 Cwt.	8.36	10.23	4.63	5.93	8.10	10.12	7.91
" " 2 "	10.21	12.27	5.23	5.02	8.50	10.64	8.65
Limestone, 1 Ton							
Cyanamide, 2 Cwt.	8.92	10.70	5.32	5.40	8.36	10.53	8.21
Sodium Nitrate, 2.69 "	8.01	11.37	5.39	4.87	8.23	9.56	7.91
" " 1.35 "	9.89	9.90	4.90	5.55	8.04	9.02	7.88
Amm. Sulph., 1 "							
	Differences not statistically significant.						
			Mean Purity.				
No Manure	84.5	84.8	91.1	88.2	86.6	86.6	87.0
Amm. Sulph., 2 Cwt.	84.6	84.6	91.7	87.5	87.5	86.0	87.0
" " 2 "	83.7	84.0	91.2	88.9	86.9	86.0	86.8
Limestone, 1 Ton							
Cyanamide, 2 Cwt.	84.9	84.1	90.6	88.8	88.1	86.2	87.1
Sodium Nitrate, 2.69 "	84.8	83.6	91.1	88.5	88.3	86.8	87.2
" " 1.35 "	83.8	85.0	90.9	88.2	88.1	87.7	87.3
Amm. Sulph., 1 "							
	Differences not statistically significant.						

(A 7—A 12) Comparisons of Ammonium Sulphate with Cyanamide on Flood-Fallowed Frontland.

Fields 28 A.E., Port Mourant; 55 T., Rose Hall; 23 K.P., Versailles; and 10 Z., Uitvlugt.

(Plant cane results reported in Sugar Bull. No. 11, p. 22.)

Table XIII shows that there were no signficant differences between the effects of ammonium sulphate and cyanamide at equivalent doses, but that in five out of the six tests there was a slight margin of cane yield in favour of the first-named fertilizer.

TABLE XIII.—**Comparisons of Ammonium Sulphate with Cyanamide on Flood-fallowed Frontland.**

Treatments per Acre.	Mean Yields in Tons Cane per Acre from P.O.J. 2878.			
	1st Ratoons.		2nd Ratoons.	
	Port Mourant, 28 A.E.	Rose Hall, 55 T.	Port Mourant, 28 A.E.	Rose Hall, 55 T.
Amm. Sulph., 4 Cwt.	30.54	33.72	31.62	31.57
Cyanamide, 4 ,,	28.40	31.97	28.14	31.96

Differences not statistically significant.

	Tons Cane per Acre.	Pol % Cane.	Glucose Ratio.	Juice Purity.
	Field 23 K.P.,	*Versailles,*	*Diamond 10,*	*1st Ratoons.*
No Manure	22.72	14.83	6.10	90.6
Amm. Sulph., 3 Cwt.	28.49	14.71	6.54	88.8
Cyanamide, 3 ,,	28.16	14.60	6.28	89.3
Sig. Diff., 20:1	2.72	—	—	—
	Field 10 Z.,	*Uitvlugt,*	*Diamond 10,*	*1st Ratoons.*
Amm. Sulph., 4 Cwt.	29.99	13.13	10.15	86.1
Cyanamide, 4 ,,	26.89	12.93	9.02	85.7

Differences not statistically significant.

(A 13—A 18) Comparisons of Ammonium Sulphate with Cyanamide and Sodium Nitrate on Flood-Fallowed Frontland.

Fields 18 G.W., Providence, B.; 2 B.L. and 12 O., Blairmont; and 1 L. Bath.

(Plant cane results reported in Sugar Bulls. Nos. 10, pp. 24 and 25 and 11, p. 23; and first ratoon in No. 11, p. 23.)

In five out of the six harvests reported in Table XIV there were margins favouring ammonium sulphate over cyanamide, but in only one case was the difference statistically significant.

Sodium nitrate gave consistently lower yields than the other two fertilizers in all five harvests in which it appeared, and in three instances the differences were statistically significant.

TABLE XIV.—**Comparisons of Ammonium Sulphate with Cyanamide and Sodium Nitrate on Flood-fallowed Frontland.**

Treatments per Acre.	Mean Yields in Tons Cane per Acre from P.O.J. 2878 at					
	Providence, B.	Blairmont,			Bath,	
	Field 18 G.W.	Field 2 B.L.	Field 12 O.		Field 1 L.	
	2nd Ratoons.	2nd Ratoons.	1st Ratoons.	2nd Ratoons	1st Ratoons.	2nd Ratoons.
No Manure	—	23.89	—	—	—	—
Amm. Sul., 2 Cwt.	—	32.02	—	—	—	—
„ „ 4 „	33.39	34.83	35.57	29.80	37.21	29.56
Cyanamide, 2 „	—	34.83	—	—	—	—
„ 4 „	30.95	33.73	31.47	28.44	36.34	27.18
Sodium Nitrate, 5.28 „	30.50	—	27.78	26.65	32.09	24.88
Sig. Diff., 20:1	—	5.33	2.77	—	2.66	2.07

(A 19—A 24) VARIOUS SOURCES OF NITROGEN ON PEGASSY CLAY.

Fields 34 S.D., Cane Grove; 20 Arc., Farm; 63 G.G. and 96 G.D., Diamond; 52 de W., Uitvlugt; and 41 D.K., De Kinderen.

Table XV presents the plant cane results from a series of tests on pegassy clay parallel to these discussed under A 1—A 6. Yields were good at Farm and at 96 G.D., Diamond. They were poor at Cane Grove, Uitvlugt and De Kinderen, while the quality of the cane was unsatisfactory at Farm and at De Kinderen. As on the frontland, the order of the treatments varied from site to site, and sodium nitrate alone was generally not quite as good as ammonium sulphate, but at most sites a mixture of sodium nitrate and ammonium sulphate was slightly better than the latter alone and, in the combined results, significantly better than the former alone. Calcium cyanamide performed better on the pegassy clay than on the frontland, and tended to surpass ammonium sulphate alone or sodium nitrate alone.

In the combined results from the six tests, the mixture of ammonium sulphate and sodium nitrate had a definite depressing effect on juice purity.

TABLE XV.—Effect of Various Sources of Nitrogen on Plant Canes on Pegassy Clay.

Treatments per Acre.	Cane Grove, Field 34 S.D. P.O.J. 2878.	Farm, Field 20 Arc. Diamond 10.	Diamond, Field 63 G.G. P.O.J. 2878.	Diamond, Field 96 G.D. Diamond 10.	Uitvlugt, Field 52 D'eW. P.O.J. 2878.	De Kinde-en, Field 41 L'eK. P.O.J. 2878	Mean of Six Tests.
			Mean Yield in Tons Cane per Acre.				
No Manure	24.11	49.17	26.52	43.52	24.49	18.69	31.08
Amm. Sulph., 5 Cwt.	25.13	50.19	31.78	52.71	23.70	19.78	33 88
" " 5 "	25.70	49.26	35.92	46.30	24.63	21.32	33.86
Limestone, 1 Ton							
Cyanamide, 5 Cwt.	25.03	53.05	30.44	47.97	26.06	22.61	34.20
Sodium Nitrate, 6.73 "	24.51	53.14	26.69	49.82	22.05	18.66	32.48
" " 3.36 "	26.24	53.81	32.34	48.03	25.30	20.83	34.43
Amm. Sulph., 2.5 "							
Sig. Diff., 20:1	—	—	—	5.22	—	2.71	1.90
			Mean Pol % Cane.				
No Manure	14.07	11.33	12.95	13.49	15.02	12.46	13.22
Amm. Sulph., 5 Cwt.	13.73	11.56	12.64	13.21	14.71	12.58	13.07
" " 5. "	14.26	10.88	13.47	13.62	15.09	12.41	13.29
Limestone, 1 Ton							
Cyanamide, 5 Cwt.	14.06	11.17	13.22	13.77	15.15	12.44	13.30
Sodium Nitrate, 6.73 "	14.22	11.25	13.41	13.57	14.44	11.81	13.12
" " 3.36 "	13.71	10.64	13.25	12.70	14.61	12.46	12.90
Amm. Sulph., 2.5 "							
			Differences not statistically significant.				
			Mean Glucose Ratio.				
No Manure	6.14	19.30	10.33	11.29	9.36	11.19	11.27
Amm. Sulph., 5 Cwt.	5.77	17.87	11.03	12.20	10.59	11.08	11.42
" " 5 "	5.30	23.36	9.02	12.57	9.68	13.65	12.26
Limestone, 1 Ton							
Cyanamide, 5 Cwt.	5.61	21.31	10.15	10.75	10.15	12.42	11.73
Sodium Nitrate, 6.73 "	6.65	21.31	9.58	10.52	9.87	14.46	12.07
" " 3.36 "	6.55	21.31	10.68	11.94	9.73	12.15	12.06
Amm. Sulph., 2.5 "							
Sig. Diff., 20:1	—	—	—	—	—	2.30	—
			Mean Purity.				
No Manure	89.6	83.2	86.5	87.2	88.8	82.4	86.3
Amm. Sulph., 5 Cwt.	89.8	84.1	84.6	86.5	88.5	82.5	86.0
" " 5 "	91.0	79.9	86.5	86.3	88.9	81.0	85.6
Limestone, 1 Ton							
Cyanamide, 5 Cwt.	89.4	81.3	86.3	88.1	87.6	82.3	85.8
Sodium Nitrate, 6.73 "	89.9	81.6	86.1	87.3	88.1	80.0	85.5
" " 3.36 "	89.3	80.6	84.6	85.4	87.7	81.5	84.8
Amm. Sulph., 2.5 "							
Sig. Diff., 20:1	—	—	—	—	—	—	0.81

(A 25—A 26) Cyanamide on Pegassy Clay.

Fields 19 G., Diamond, and 100 A.C., Leonora.

As will be seen from Table XVI, yields were high for this soil type at Diamond and satisfactory at Leonora. The fertility level of the Diamond field appears to have been so high that the nitrogen dressings had no significant effects. At Leonora, 1.5 cwt./acre of cyanamide gave a significant increment over no cyanamide, but Table XXVIII shows clearly that at both sites molasses has given excellent results.

Table XVI.—**Effect of Cyanamide on Pegassy Clay.**

Treatments per Acre.	Cane per Acre, Tons.	Pol % Cane.	Glucose Ratio.	Juice Purity.
	Field 19 G., Diamond, Diamond 10, Plants.			
No Cyanamide	55.86	14.93	5.53	89.5
Cyanamide, 1.5 Cwt.	53.18	15.08	5.01	89.9
„ 3.0 „	55.60	14.69	4.86	89.2
	Differences not statistically significant.			
	Field 100 A.C., Leonora, P.O.J. 2878, Plants.			
No Cyanamide	39.15	12.88	9.78	86.0
Cyanamide, 1.5 Cwt.	43.27	12.34	10.76	84.3
„ 3.0 „	42.51	12.57	9.39	84.6
Sig. Diff., 20:1	3.56	—	—	—

(A 27—A 30) Varying Levels of Ammonium Sulphate on Pegassy Clay.

Fields 102 G.D., Diamond; 41 E. and 93 M.Z., Uitvlugt.

(Plant cane results reported in Sugar Bull. No. 11, p. 23.)

In the past, a number of experiments of this nature have suggested that, on pegassy clay, the optimum dressing of ammonium sulphate should be in the neighbourhood of five cwt./acre. The tests reported in Table XVII, however, yielded no significant differences between treatments, although at 93 M.Z., Uitvlugt, the increment due to eight cwt. over four was almost statistically significant but not economic. At that site, however, there was a significant interaction between nitrogen and potash which appears to have masked the effect of increasing the amount of the former. Thus when nitrogen alone was given, four cwt./acre of ammonium sulphate yielded 26.75 tons/acre of cane, while eight cwt./acre yielded 35.64 tons/acre of cane. Both nitrogen and potash raised the yield, but together they were not very efficient, and in practice it will probably prove more satisfactory to use ammonium sulphate for this purpose.

At 102 G.D., Diamond, there had been a definite improvement in the plant cane yield with rising levels of nitrogen.

TABLE XVII.—**Effect of Different Levels of Ammonium Sulphate on Pegassy Clay.**

Ammonium Sulphate, Cwt. per Acre.	Mean Yields in Tons Cane per Acre at			
	Diamond,	Uitvlugt,		
	Field 102 G.D., Diamond 10,	Field 41 E., P.O.J. 2878,		Field 93 M.Z., P.O.J. 2878,
	1st Ratoons.	1st Ratoons.	2nd Ratoons.	1st Ratoons.
3	33.46	—	—	—
4	33.96	34.67	28.57	29.28
5	33.94	—	—	—
6	—	35.36	27.83	31.96
8	—	35.24	26.99	32.11
	Differences not statistically significant.			

(A 31—A 34) COMPARISONS OF AMMONIUM SULPHATE AND CYANAMIDE ON PEGASSY CLAY.

Fields 43 Gv. and 68 E., Leonora, and 40 E., Uitvlugt.

(Plant cane results reported in Sugar Bulls. Nos. 10, p. 29, and 11, p. 24, and first ratoon in No. 11, p. 24).

In none of the tests reported in Table XVIII was there any significant difference between the effects of ammonium sulphate and cyanamide. At the two Leonora sites the margins were in favour of the latter, while at Uitvlugt they were in favour of the former.

TABLE XVIII.—**Comparison of Ammonium Sulphate with Cyanamide on Pegassy Clay.**

Treatments per Acre.	Cane per Acre, Tons.	Pol % Cane.	Glucose Ratio.	Juice Purity.
	Field 43 G.V., Leonora, P.O.J. 2878, 2nd Ratoons.			
No Manure	23.50	—	—	—
Amm. Sulph., 3 Cwt.	19.73	—	—	—
Cyanamide, 3 „	24.77	—	—	—
	Differences not statistically significant.			
	Field 68 E., Leonora, P.O.J. 2878, 2nd Ratoons.			
Amm. Sulph., 3 Cwt.	30.24	—	—	—
„ „ 5 „	32.69	—	—	—
Cyanamide 3 „	31.40	—	—	—
„ „ 5 „	33.06	—	—	—
	Differences not statistically significant.			
	Field 40 E., Uitvlugt, P.O.J. 2878, 1st Ratoons. (Square A).			
Amm. Sulph., 5 Cwt.	27.29	13.31	10.04	86.5
Cyanamide 5 „	25.83	13.62	7.41	88.4
	Differences not statistically significant.			
	Field 40 E., Uitvlugt, P.O.J. 2878, 1st Ratoons. (Square B)			
Amm. Sulph., 5 Cwt.	28.06	14.05	8.35	87.3
Cyanamide 5	24.71	11.42	7.47	89.7
	Differences not statistically significant.			

SUB-SECTION B.—PHOSPHATIC MANURES.

(B 1—B 16) PHOSPHATIC MANURING ON FLOOD-FALLOWED FRONTLAND.

Fields B., S.G., Skeldon; 35 A., Port Mourant; 10 P. and 1 F.F.A., Rose Hall; 18 G.W., Providence, B.; 26 Rp., 12 O., 7 B.L. and 23 Rp., Blairmont; 1 L., Bath; and 29 V.B., Wales.

(Plant cane results reported in Sugar Bulls. Nos. 8, p. 58, 9, p. 32, 10, pp. 25 and 31, and 11, p. 25, first ratoon in Nos. 9, p. 34, 10, p. 26, and 11, p. 25, second ratoon in Nos. 10, p. 26, and 11, p. 25, and third ratoon in No. 11, p. 25.)

Table XIX confirms the previous conclusion that few flood-fallowed frontlands respond to phosphates. It has also been established that placement of the fertilizer, whether on the surface or at a depth of nine inches, is not the determining factor.

Phosphatic manuring cannot be advised for the sites tested at Skeldon, Port Mourant, Rose Hall and Wales, or for Fields 12 O, and 7 B.L. at Blairmont.

The margins in favour of phosphatic manuring in the second ratoon harvest at Field 18 G.W., Providence, Berbice, were not statistically significant, but they had been in the two previous crops, and dressings can be advised.

The true position at Field 26 Rp., Blairmont, is not revealed by the figures in the Table which are the means from a complex experiment involving different levels of phosphate, limestone and potash. Phosphate had given definite increments at this site in the previous cycle and in the plant canes of the present cycle. In the first ratoons of this cycle, however, a definite interaction between phosphate and calcium made itself felt. In the absence of calcium, phosphate increased the yield. In the absence of phosphate, calcium increased the yield, but in the presence of high calcium, phosphate tended to have an adverse effect on the yield. Conversely, in the presence of high phosphate, calcium tended to reduce the output. On the other hand, combined medium dressings of the two elements gave satisfactory results. Depending then on their relative costs and availability, six cwt./acre of superphosphate (or the equivalent in basic slag or rock phosphate), or two tons/acre of limestone, or half doses of both together, should be given this area. There was also, in this field, a significant interaction between phosphate and potash, the former being most efficient at the high level of the latter.

In view of the results from Field 26 Rp., Blairmont, the statistically insignificant increments attributable to phosphate at Field 23 Rp., are suggestive.

Field 1 L., Bath, has yielded a significant response to phosphate in all three harvests and this element can be advised for that area.

TABLE XIX.—Effect of Phosphatic Manuring on Flood-fallowed Frontland.

Mean Yields in Tons Cane per Acre from P.O.J. 2878 at

Treatments in Cwt./Acre.		lb. P_2O_5 /Acre.	Skeldon. Field B.S.G. 1st Ratoons.	Skeldon. Field B.S.G. 2nd Ratoons.	Port Mourant. Field 35 A. 1st Ratoons.	Port Mourant. Field 35 A. 2nd Ratoons.	Rose Hall. Field 10 P. 2nd Ratoons.
No Phosphate			36.29	27.02	34.64	26.01	31.09
Rock Phosphate	3	103	—	—	—	—	26.66
,, ,,	3	103	—	—	—	—	32.07
,, ,,	6	206	—	—	—	—	27.49
,, ,,	6	206	—	—	—	—	33.63
,, ,,	9	309	35.38	27.35†	37.87	26.56†	27.05
,, ,,	9	309	36.29	25.32†	36.65	25.27†	31.98
,, ,,	12	412	33.51	26.78†	35.10	25.37†	—
,, ,,	12	412	38.01	27.65†	37.77	25.61†	—
,, ,,	15	515	36.21	28.38†	36.31	25.39†	—
,, ,,	15	515	39.21	27.62†	36.59	22.47†	—

Differences not statistically significant.

Treatments in Cwt./Acre.		lb. P_2O_5 /Acre.	Rose Hall. Field 1 F.F.A. 4th Ratoons.	Providence, B. Field 18 G.W. 2nd Ratoons.	Blairmont. Field 26 Rp. 1st Ratoons	Blairmont. Field 26 Rp. 2nd Ratoons.	Blairmont. Field 12 O. 1st Ratoons.	Blairmont. Field 12 O. 2nd Ratoons.	Blairmont. Field 7 B.L. 2nd Ratoons.	Blairmont. Field 23 Rp. 3rd Ratoons.	Bath. Field 1 L. 1st Ratoons.	Bath. Field 1 L. 2nd Ratoons.	Wales. Field 29 V.B. 1st Ratoons.
No Phosphate			19.76	30.77	28.82	25.61	31.18	28.78	21.49	36.89	33.71	26.65	33.29
Rock Phosphate	2.75	94	—	32.46	—	—	32.03	27.82	—	—	36.72	27.78	—
,, ,,	9	309	—	—	—	—	—	—	—	—	—	—	36.34
,, ,,	12	412	—	—	—	—	—	—	—	—	—	—	35.02
,, ,,	15	515	—	—	—	—	—	—	—	—	—	—	35.20
Superphosphate	2	36	—	—	—	—	—	—	21.84*	—	—	—	—
,,	3	54	—	—	29.11	25.69	—	—	—	—	—	—	—
,,	4	72	—	—	—	—	—	—	22.27*	—	—	—	—
,,	5.25	94	20.75‡	—	—	—	—	—	—	—	—	—	—
,,	6	108	—	—	27.83	25.02	—	—	21.72*	—	—	—	—
,,	8	144	—	—	—	—	—	—	19.36*	—	—	—	—
Nicifos	4.68	94	20.08‡	32.21	—	—	34.56	29.70	—	38.47	36.98	30.45	—
Basic Slag	12	202	—	—	—	—	—	—	—	—	—	—	35.68
,, ,,	5.61	94	21.73‡	—	—	—	—	—	—	38.38	—	—	—
Sig. Diff., 20:1			—	—	—	—	2.28	—	—	—	2.19	1.69	—

*Residual effect from plant cane application.
‡Residual effect from applications to the four previous crops.
†Residual effect from applications to the two previous crops.

(B 17—B 27) Phosphatic Manuring on Pegassy Clay.

Fields 18 U., Cane Grove; 102 G.D., 93 G.D. and 19 G., Diamond; 100 A.C., 65 Ed. and 43 G.V., Leonora; 41 E. and 93 M.Z., Uitvlugt.

(Plant cane results reported in Sugar Bulls. Nos. 10, p. 33, and 11, p. 27, and first ratoon in No. 11, p. 27.)

From Table XX it will be seen that there was a definite response to phosphate at six out of the nine sites.

At Cane Grove the increments have been marked in all three crops, and single dressings of six and nine cwt./acre of rock phosphate to the plants only have given increments of 25 and 27 tons/acre of cane, respectively, in three harvests. The results indicate that a single dressing of six cwt./acre of rock phosphate to the plants is the optimum application.

At 102 G.D., Diamond, a single dressing of ten cwt./acre of basic slag to the plants has yielded significant increments in both harvests totalling 5.66 tons/acre of cane. The economics of such a small response will depend on the relative values of cane and of the fertilizer at any given time.

At 93 G.D., Diamond, there was a definite response to phosphate in the plant canes, but not in either ratoon crop, and its use there cannot be advised.

At 19 G., Diamond, there was a definite response to phosphate in the plant canes, but molasses dressings (see E 12) were even more effective.

At 100 A.C., Leonora, the yield differences attributable to phosphatic manuring were not statistically significant.

At 65 Ed., Leonora, there had been a very suggestive increment in the plant canes, and in the second ratoons it was statistically significant and definitely economic. Unfortunately, it was not possible to secure the weights of the first ratoon crop, but large scale cultivation has demonstrated that this part of the Edinburgh section responds to phosphates.

At 43 Gv., Leonora, the response to phosphates has been most marked in both the plant cane and the second ratoon crop. As in the case of 65 Ed., it was not possible to weigh the first ratoon crop, but there can be no doubt as to the need for phosphate in this area and the Estate is using it. The economic dressing appears to be ten cwt./acre of rock phosphate to the plants as this has given a total increment of sixteen tons/acre of cane for the two crops weighed (plant canes and second ratoons) and it can be assumed that there was a further increment of about eight tons/acre in the unweighed first ratoons, for on inspection of that crop the phosphate effect was very obvious.

At 41 E., Uitvlugt, the slight increments attributable to phosphate in each crop have been either statistically significant nor economic, but it is of interest to note that rock phosphate has consistently been slightly better than basic slag.

At 93 M.Z., Uitvlugt, the plant cane increments attributable to phosphate were not significant, but that from rock phosphate was definitely so in the first ratoons.

TABLE XX.—Effect of Phosphatic Manuring on Pegassy Clay.

Treatments in Cwt./Acre.	lb. P_2O_5 per Acre.	Mean Yields in Tons Cane per Acre at										
		Cane Grove.		Diamond.			Leonora.			Uitvlugt.		
		Field 18 U., P.O.J. 2878,		Field 102 G.D., Diamond 10, 1st Ratoons.	Field 93 G.D., Diamond 10, 2nd Ratoons.	Field 19 G., Diamond 10, Plants.	Field 100 A.C., P.O.J 2878, Plants.	Field 65 Ed., P.O.J. 2878, 2nd Ratoons.	Field 43 G.V., P.O.J. 2878, 2nd Ratoons.	Field 41 E., P.O.J. 2878,		Field 93 M.Z., P.O.J. 2878, 1st Ratoons.
		1st Ratoons.	2nd Ratoons.							1st Ratoons.	2nd Ratoons.	
No Phosphate	—	19.47	13.37	31.78	34.45	52.18	40.86	25.16	19.73	33.81	26.93	29.02
Rock „ 3	103	26.89	17.69†	—	—	—	—	—	—	—	—	—
„ „ 3	103	24.73*	16.32*	—	—	—	—	—	—	—	—	—
„ „ 6	206	28.33	17.57†	—	—	—	—	—	—	36.95	28.79	32.44
„ „ 6	206	30.27*	16.69*	—	—	—	—	—	—	—	—	—
„ „ 9	309	28.89	17.64†	—	—	—	—	—	—	—	—	—
„ „ 9	309	30.69*	17.08*	—	—	—	—	—	—	—	—	—
„ „ 10	343	—	—	—	—	—	—	—	26.63	—	—	—
„ „ 20	687	—	—	—	—	—	—	—	30.31	—	—	—
Basic Slag 3	50	—	—	—	33.86†	—	—	—	—	—	—	—
„ „ 5	84	—	—	34.56*	—	56.14	40.25	34.02	—	—	—	—
„ „ 6	101	—	—	—	—	—	—	—	—	34.51	27.67	31.90
„ „ 6	101	—	—	—	32.93†	—	—	—	—	—	—	—
„ „ 10	168	—	—	35.02*	—	56.31	43.81	36.50	—	—	—	—
Sig. Diff., 20:1	—	4.48	3.25	2.72	—	4.13	—	5.42	8.06	—	—	3.04

* Residual effects from plant cane dressings.
† „ „ „ „ „ and 1st ratoon dressings.

SUB-SECTION C. POTASSIC MANURES.

(C 1—C 3) Potassium Sulphate on Flood-Fallowed Frontland. *Field 26 Rp., Blairmont.*

The results of the previous cycle and the first two crops of the present cycle did not suggest that potassic manuring would be an economic proposition for this area, but Table XXI shows that there was a definite response in the second ratoons. There had been a significant interaction between calcium and potash in the plant canes of the present cycle, the one or the other being better than a combination of the two, and calcium alone being better than potash alone. In the second ratoon crop there were significant interactions between potash and phosphate and between potash and calcium. Phosphate was most effective in the presence of the higher level of potash, while potash and calcium were most efficient in the absence of each other. In the absence of calcium, potassium sulphate yielded increments of nine and thirteen tons/acre of cane for dressings of two and four cwt./acre, respectively.

Table XXI.—**Effect of Different Levels of Potassium Sulphate on Flood-fallowed Frontland.**

Potassium Sulphate, Cwt./Acre.	Mean Yields in Tons Cane per Acre from P.O.J. 2878 at Blairmont, Field 26 Rp.		
	Plants.	1st Ratoons.	2nd Ratoons.
0	41.29	27.62	22.23
2	41.48	29.18	26.56
4	42.64	28.95	27.53
Sig. Diff., 20:1	—	—	4.07

(C 4—C 11) Potassium Sulphate and Chloride on Pegassy Clay.

Fields 102 G.D. and 93 G.D., Diamond; 65 Ed., 68 Ed. and 43 Gv., Leonora; 41 E. and 93 M.Z., Uitvlugt.

(Plant cane results reported in Sugar Bulls. Nos. 10, pp. 29 and 36, and 11, p. 29, and first ratoon in No. 11, p. 29.)

The results of these tests are presented in Table XXII.

At 102 G.D. and 93 G.D., Diamond, the increments were not statistically significant although they had been in the plant cane crop at the former site and the first ratoon crop at the latter. It is doubtful whether potassic manuring would prove economic for either field, nor can it be advised for any of the three Leonora fields (65 Ed., 68 Ed. and 43 Gv.) under discussion.

At 41 E., Uitvlugt, there has been a signficant response to potash in all three harvests, and when potassic fertilizers are again available they should be used from 31 E. to 43 E.

At 93 M.Z., Uitvlugt, there was a very marked response to potash in the plants, and a detailed examination of the first ratoon results indicates that it had a very marked effect in that crop as well, although this is not obvious from the Table owing to a significant interaction between nitrogen and potash. With four cwt./acre of ammonium sulphate, potash increased the yield, while with eight cwt./acre of ammonium sulphate it depressed it. Actually, the best yield was obtained by a combination of six cwt./acre of ammonium sulphate with potash.

There are no indications from these tests that there is any difference in the effectiveness of the two sources of potash used.

TABLE XXII.—Effect of Potassium Sulphate and Chloride on Pegassy Clay.

Potash Treatments.	lb. K_2O per Acre.	Mean Yields in Tons Cane per Acre at							
		Diamond.		Leonora.			Uitvlugt.		
		Field 102 G.D., Diamond 10, 1st Ratoons.	Field 93 G.D., Diamond 10, 2nd Ratoons.	Field 65 Ed., P.O.J. 2878, 2nd Ratoons.	Field 68 Ed., P.O.J. 2878, 2nd Ratoons.	Field 43 G.V., P.O.J. 2878, 2nd Ratoons.	Field 41 E., P.O.J. 2878.		Field 93 M.Z., P.O.J. 2878, 1st Ratoons
							1st Rats.	2nd Rats.	
No Potash	—	33.58	33.20	30.20	31.71	19.73	33.18	—	30.36
Potassium Sulph.	110	33.70	33.86	32.03	31.95	—	36.55	25.06	31.32
,, ,,	165	—	—	—	—	—	—	28.71	—
,, ,,	220	34.07	34.18	33.45	—	—	—	29.61	—
,, Chloride	110	—	—	—	31.88	—	35.55	—	31.68
,, ,,	165	—	—	—	—	21.48	—	—	—
Sig. Diff., 20:1		—	—	—	—	—	2.41	2.64	—

SUB-SECTION D.—LIMING MATERIALS.

(D 1—D 6) Residual Effects of Liming Materials on Flood-fallowed Frontland.

Fields 31 K., Albion; 26 Rp., 7 B.L. and 71 B.L., Blairmont; and 16 E.P., Enmore.

(Plant cane results reported in Sugar Bulls. Nos. 9, p. 48, 10, pp. 36 and 37, and 11, p. 30, first ratoon in Nos. 10, p. 36, and 11, p. 30, and second ratoon in No. 11, p. 30.)

Of the experiments listed in Table XXIII, those at Albion, Enmore and Field 71 B.L., Blairmont, form a chain designed to measure the long-term effects of light dressings of liming materials at each replanting, as is the commercial practice. The harvests here recorded form part of the second cycle since the chain was started. It cannot be said that, as yet, there is any clear effect on yield.

At Field 7 B.L., Blairmont, heavy dressings to the plants have failed to yield any response in that or the two succeeding crops.

At Field 26 Rp., Blairmont, limestone yielded a significant increment in the plants, and a detailed examination of the ratoon results reveals that its effects, as they appear in the Table, have been masked by the complex nature of the experiment, there being significant interactions between calcium and phosphate and between calcium and potash. In regard to the last element, it appears that calcium alone or potash alone gives better results than the two together, and in regard to phosphate that the best results are obtained by high calcium or high phosphate dressings, or by a combination of the two in medium doses, but that a combination of the two in high doses is unsatisfactory.

TABLE XXIII.—**Residual Effect of Liming Materials on Flood-fallowed Frontland.**

Treatments in Tons/Acre.	Mean yields in Tons Cane per Acre from P.O.J. 2878 at					
	Albion,	Blairmont,				Enmore,
	Field 31K. 3rd Ratoons.	Field 26 Rp. 1st Ratoons.	Field 26 Rp. 2nd Ratoons.	Field 7 B.L. 2nd Ratoons.	Field 71 B.L. 2nd Ratoons.	Field 16 E.P. 1st Ratoons.
No Liming Materials	24.00	27.53	24.84	24.49	24.22	29.23
Lime 0.5 Tons.	24.77	—	—	—	23.60	27.80
„ 1.0 „	25.25	—	—	—	24.30	28.46
Ground Limestone 0.5 Tons.	26.39	—	—	—	23.93	30.37
„ 1.0 „	25.00	28.68	24.99	—	24.14	30.52
„ 2.0 „	—	29.55	26.49	23.55	—	—
„ 4.0 „	—	—	—	23.47	—	—
„ 6.0 „	—	—	—	22.47	—	—
„ 8.0 „	—	—	—	24.75	—	—

Differences not statistically significant.

(D 7—D 10) Residual Effect of Ground Limestone on Pegassy Clay.

Fields 102 G.D. and 93 G.D., Diamond; and 65 Ed. and 43 Gv., Leonora.

(Plant cane results reported in Sugar Bulls. Nos. 10, p. 37, and 11, p. 30 and first ratoon in No. 11, p. 30.)

Table XXIV presents the results of these four tests and it will be seen that only at 43 Gv., Leonora, was there a statistically significant residual effect from the plant cane applications of limestone.

Some evidence has been obtained that Colony soils which respond to calcium also respond to phosphate, and *vice versa*, and that on such soils the highest yields may be expected from the higher dressings of one of these elements alone or from medium dressings of both elements. Both of the Diamond sites have a high content of available phosphate and this may account for the poor response to calcium.

At 65 Ed., Leonora, there had been strong indications of an interaction between calcium and phosphate in the plant canes and the best yields were given by three cwt./acre of basic slag with two tons/acre of limestone, by six cwt./acre of basic slag alone, and by one ton/acre of limestone alone. Unfortunately, the first ratoons could not be weighed as they were cut early by the Estate authorities for planting material, and the effect of the limestone had dwindled to insignificance by the time the second ratoons were harvested. The commercial results from this part of the Edinburgh section, however, indicate a satisfactory response to both lime and phosphate.

At 43 Gv., Leonora, the effect of limestone had been only slight in the plant canes and, as at 65 Ed., Leonora, the first ratoons were cut for planting material and no weights were secured, but the residual effect of calcium on the second ratoon crop was definitely significant.

It may be added that this site gave very marked response to phosphate both in the plants and in the ratoons (residual), and that some extra observation plots, not included in the statistical layout, indicated clearly that the second ratoon response was satisfactory from plots treated with either four tons/acre of limestone, or one ton/acre of rock phosphate, or two tons/acre of limestone, together with half ton/acre of rock phosphate, but unsatisfactory with four tons/acre of limestone and one ton/acre of rock phosphate.

TABLE XXIV.—**Residual Effect of Ground Limestone on Pegassy Clay.**

Tons per Acre of Ground Limestone.	Mean Yields in Tons Cane/Acre at			
	Diamond,		Leonora,	
	Field 102 G.D., Diamond 10, 1st Ratoons.	Field 93 G.D., Diamond 10, 2nd Ratoons.	Field 65 Ed., P.O.J. 2878, 2nd Ratoons.	Field 43 G.V., P.O.J. 2878, 2nd Ratoons.
0	32.87	33.03	31.34	25.27
1	—	33.28	32.23	—
2	34.93	34.92	32.12	31.80
4	33.56	—	—	32.76
Sig. Diff., 20:1	—	—	—	5.72

SUB-SECTION E.—ORGANIC MANURES.

(E 1—E 4) RESIDUAL EFFECTS OF PEN MANURE AND FILTER-PRESS CAKE ON FLOOD-FALLOWED FRONTLAND.

Fields 26 Bk., Blairmont; 23 K.P., Versailles; and 10 Z., Uitvlugt.
(Plant cane results reported in Sugar Bull. No. 11, p. 32.)

The results of these tests appear in Table XXV where it will be seen that the yield was poor at Blairmont but that, at all three sites, there was evidence of residual effect from the organic manures.

At Blairmont, the residual effect of 13 tons/acre of filterpress cake applied to the plants was significantly better than the control, and dressings of 3 cwt./acre of ammonium sulphate to plots which had received organic manures as plants gave returns closely approximating that from 4 cwt./acre of ammonium sulphate.

At Versailles, the residual effect of filterpress cake was very marked, but that of pen manure was not so clearly defined.

At Uitvlugt, the residual effects were more obvious in Square B than in Square A.

TABLE XXV.—Residual Effect of Pen Manure and Filterpress Cake on First Ratoons on Flood-fallowed Frontland.

Treatments per Acre. Plants.	1st Ratoons.	Cane per Acre, Tons.	Pol % Cane.	Glucose Ratio.	Juice Purity.
	Field 26 Bk., Blairmont, P.O.J. 2878.				
No Manure	No Manure	13.65	—	—	—
Amm. Sulph., 2 Cwt.	Amm. Sulph., 4 Cwt.	21.80	—	—	—
Press Cake, 6.5 Tons.	No Manure	14.17	—	—	—
,, ,, , 6.5 ,,	Amm. Sulph., 1.5 Cwt.	18.11	—	—	—
,, ,, , 6.5 ,,	,, ,, , 3 ,,	20.87	—	—	—
,, ,, , 13.0 ,,	No Manure	16.15	—	—	—
,, ,, , 13.0 ,,	Amm. Sulph., 1.5 Cwt.	18.26	—	—	—
,, ,, , 13.0 ,,	,, ,, , 3 ,,	20.91	—	—	—
Burnt Press Cake, 6.1 ,,	No Manure	14.15	—	—	—
Burnt Press Cake, 6.1 ,,	Amm. Sulph., 2 Cwt.	18.01	—	—	—
Sig. Diff., 20:1		2.35	—	—	—
	Field 23 K.P., Versailles, Diamond 10.				
No Manure,	No Manure	22.72	14.83	6.10	90.6
Amm. Sulph., 5 Cwt.	Amm. Sulph., 3 Cwt.	28.49	14.71	6.54	88.8
Press Cake, 11.75 Tons.	No Manure	27.37	14.27	5.75	88.7
,, ,, , 11.75 ,,	Amm. Sulph., 1.5 Cwt.	29.64	14.61	5.56	88.2
Pen Manure, 15.75 ,,	No Manure	22.72	14.47	6.65	90.6
Pen Manure, 15.75 ,,	Amm. Sulph., 1.5 Cwt.	27.10	15.12	4.63	91.5
Sig. Diff., 20:1		2.72	—	—	—
	Field 10 Z., Uitvlugt, Diamond 10. (Square "A").				
Amm. Sulph., 2 Cwt.	Amm. Sulph., 4 Cwt.	28.15	13.04	8.90	86.5
Press Cake, 6.0 Tons.	,, ,, , 3 ,,	25.73	12.73	10.06	86.1
Pen Manure, 10.0 ,,	,, ,, , 3 ,,	25.15	13.27	8.14	86.6
	Differences not statistically significant.				
	Field 10 Z., Uitvlugt, Diamond 10. (Square "B").				
Amm. Sulph., 2 Cwt.	Amm. Sulph., 4 Cwt.	31.83	13.22	**11.40**	85.8
Press Cake, 6.0 Tons.	,, ,, , 2 ,,	29.68	13.79	8.51	87.0
Pen Manure, 10.0 ,,	,, ,, , 2 ,,	30.32	12.95	8.77	85.6
	Differences not statistically significant.				

(E 5—E 8) Residual Effects of Pen Manure and Filterpress Cake on Flood-fallowed Frontland.

Fields 28 A., Port Mourant; and 55 T., Rose Hall.

(Plant cane results reported in Sugar Bull. No. 11, p. 31.)

It will be recalled that six tests on this soil type were harvested as plants and reported on in the last Bulletin of this series. They indicated that 12 15 tons acre of pen manure or filterpress cake could replace the normal plant cane dressing of ammonium sulphate. In the two experiments under discussion, an effort was made to determine whether the normal ammonium sulphate application for ratoons could be reduced if the plant canes had had organic manures. It will be seen from Table XXVI that there were no significant differences between the yields of plots which received the normal dressings of ammonium sulphate as plants and as ratoons, and the yields of plots which received organic manures as plants and a reduced dressing of ammonium sulphate as ratoons. The general trend of the figures suggests that the residual effects of 10 tons/acre of pen manure are more marked than are those of 5 tons/acre of filterpress cake and that 3 cwt. acre of ammonium sulphate would be an economic dressing for first and second ratoons which had been given 10 tons/acre of pen manure as plants.

TABLE XXVI.—**Residual Effect of Pen Manure and Filterpress Cake on P.O.J. 2878 on Flood-fallowed Frontland.**

Treatments per acre.	Square "A."		Square "B."	
	Port Mourant. Field 28 A.	Rose Hall, Field 55 T.	Port Mourant. Field 28 A.	Rose Hall, Field 55 T.
	First Ratoons.			
Ammonium Sulphate, 4 Cwt.	31.95	32.52	29.14	31.91
Filterpress Cake, 5 Tons*	28.58	29.31	26.10	32.99
Pen Manure, 10 Tons*	30.41	31.72	27.49	32.78
	Second Ratoons.			
Ammonium Sulphate, 4 Cwt.	31.19	33.12	32.04	30.92
Filterpress Cake, 5 Tons*	28.53	32.77	31.06	31.09
Pen Manure, 10 Tons*	30.26	36.98	31.40	32.20

Differences not statistically significant.

*Organic manures applied to Plant Canes only. As First Ratoons Square A received 3 Cwt. and Square B 2 Cwt. per acre of Ammonium Sulphate, while as Second Ratoons both squares received 3 Cwt. per acre of Ammonium Sulphate on the organic manure plots.

(E 9—E 10) Effect of Molasses on Flood-fallowed Frontland.
Field 5 Rp., Blairmont; and 23 K.P., Versailles.

The results from these two experiments appear in Table XXVII.

When the test at Blairmont was planned it was feared that molasses dressings to young plant canes might have an adverse effect if they could not be made some weeks before planting, but the standard practice of flood-fallowing and planting immediately after the water is released precluded that precaution being taken. As a compromise, it was decided to apply the molasses early in the growth of the last crop of the cycle (where any possible damage might be minimised by the strong ratoon root system and could, in any case, only affect one crop) and test the new cycle for any residual effects of the molasses which might appear after the flood-fallow.

It will be seen that :

i. Molasses applied to a growing third ratoon crop had no adverse but a beneficial effect;

ii. Five tons/acre of molasses and two cwt./acre of ammonium sulphate proved as efficient as the normal four cwt./acre of ammonium sulphate, and more so than ten tons/acre of molasses alone;

iii. There was a tendency, not definitely significant, for molasses in the row to be more efficient than on the bank.

At Versailles there was no definite residual effect from a dressing of molasses given the plants.

TABLE XXVII.—Effect of Molasses on Flood-fallowed Frontland.

Treatments per Acre.	5 Rp., Blairmont, Diamond 10, 3rd Ratoons. Cane per Acre, Tons.	23 K.P., Versailles, Diamond 10, 1st Ratoons.			
		Tons Cane per Acre.	Pol % Cane.	Glucose Ratio.	Juice Purity.
Control	35.78	22.72	14.83	6.10	90.6
Amm. Sulph., 3 Cwt.	—	28.49	14.71	6.54	88.8
Amm. Sulph., 4 Cwt.	41.53	—	—	—	—
Molasses on Bank, 10 Tons.	36.05	—	—	—	—
„ in Row, 10 Tons.	37.58	—	—	—	—
„ on Bank, 5 Tons.					
Amm. Sulph., 2 Cwt.	41.20	—	—	—	—
Molasses in Row, 5 Tons.					
Amm. Sulph., 2 Cwt.	43.00	—	—	—	—
*Molasses, 5.75 Tons.					
Amm. Sulph., 3 Cwt.	—	29.19	14.52	6.20	90.0
Sig. Diff., 20:1	3.81	2.72	—	—	—

*Residual Effect from Plant Cane application.

(E 11—E 13) Effect of Molasses on Pegassy Clay.

Fields 6 Rp., Blairmont; 19 G., Diamond, and 100 A.C., Leonora.

This test at Blairmont was a replicate of E 9, except that it was on flood-fallowed pegassy clay instead of an flood-fallowed frontland. Table XXVIII discloses that :

i. The beneficial response to treatments was even greater on this soil type than in Field 5 Rp.;

ii. As in Field 5 Rp., five tons/acre of molasses with two cwt./acre of ammonium sulphate proved better than ten tons/acre of molasses alone, but molasses alone was markedly more effective on the pegassy clay than on the frontland (*cf.* also E 12 and E 13 below) ;

iii. On this soil type, contrary to the case on frontland, there was a tendency, not statistically significant, for molasses to be more effective on the bank than on the row.

The trials at Diamond and Leonora were with plant canes on pegassy clay which had not been flood-fallowed, the molasses having been applied several weeks before replanting. It is clear that at both sites molasses had a marked beneficial effect on yield and that there was also a significant beneficial effect on quality at Leonora from 6.6 tons/acre which proved to be the economically sound dose for both sites.

TABLE XXVIII.—Effect of Molasses on Pegassy Clay.

Treatments per Acre.	6 Rp., Blairmont, P.O.J. 2878.	19 G., Diamond, Diamond 10, Plants.				100 A.C., Leonora, P.O.J. 2878, Plants.			
	3rd Ratoons. Cane per Acre, Tons.	Tons Cane per Acre.	Pol % Cane.	Glucose Ratio.	Juice Purity.	Tons Cane per Acre.	Pol % Cane.	Glucose Ratio.	Juice Purity.
Control	18.00	50.95	14.83	5.25	89.3	35.62	12.34	11.59	84.6
Amm. Sulph., 4 Cwt.	29.52	—	—	—	—	—	—	—	—
Molasses on Bank, 10 Tons	28.45	—	—	—	—	—	—	—	—
in Row 10 Tons	26.40	—	—	—	—	—	—	—	—
„ on Bank, 5 Tons } Amm. Sulph., 2 Cwt. }	31.19	—	—	—	—	—	—	—	—
Molasses in Row, 5 Tons } Amm. Sulph., 2 Cwt. }	30.00	—	—	—	—	—	—	—	—
Molasses, 6.62 Tons	—	56.06	14.77	14.99	89.4	44.48	13.04	8.91	85.6
„ 13.24 „	—	57.63	15.10	5.15	89.8	44.83	12.42	9.44	84.7
Sig. Diff., 20 : 1	3.63	4.13	—	—		3.56	0.60	1.66	—

(E 14—E 16) Residual Effects of Pen Manure and Filterpress Cake on Pegassy Clay.

Fields 43 Gv., Leonora and 40 E., Uitvlugt.

(Plant cane results reported in Sugar Bull. No. 11, p. 33.)

Table XXIX presents the results from these three experiments.

At Leonora, the residual effect in second ratoons from the plant cane application of pen manure was as marked and as definite as the plant cane response had been.

At Uitvlugt, 4 cwt./acre of ammonium sulphate on plots which had received organic manures proved as satisfactory as five cwt./acre on plots which had not been previously dressed with organics, but the residual effects of the organic manures were not sufficient to offset a drop of 2 cwt./acre in the ammonium sulphate application.

TABLE XXIX.—**Residual Effects of Pen Manure and Filterpress Cake on Pegassy Clay.**

Treatments per Acre.		Cane per Acre, Tons.	Pol. % Cane.	Glucose Ratio.	Juice Purity.
		Field 43 Gv., Leonora, P.O.J., 2878, 2nd Ratoons.			
Amm. Sulph.,	3 Cwt.	25.99	—	—	—
*Pen Manure,	12 Tons	33.90	—	—	—
Amm. Sulph.,	3 Cwt				
Sig. Diff., 20:1		4.66	—	—	—
		Field 40 E., Uitvlugt, P.O.J. 2878 1st Ratoons (Square "A")			
Amm. Sulph.,	5 Cwt.	27.29	13.31	10.04	86.5
*Filterpress Cake,	12 Tons.	26.92	13.38	10.80	84.4
Amm. Sulph.,	4 Cwt.				
*Pen Manure,	15 Tons.	28.91	13.43	9.41	87.9
Amm. Sulph.,	4 Cwt.				
		Differences not statistically significant.			
		Field 40 E., Uitvlugt, P.O.J., 2878, 1st Ratoons (Square "B")			
Amm. Sulph.,	5 Cwt.	28.06	14.02	8.35	87.3
*Filterpress Cake,	12 Tons.	25.04	13.80	9.74	85.9
Amm. Sulph.,	3 Cwt.				
*Pen Manure,	15 Tons.	25.29	14.02	7.52	88.1
Amm. Sulph.,	3 Cwt.				
		Differences not statistically significant.			

* Organic manures applied to plant cane only.

SUB-SECTION F.—DISCUSSION AND SUMMARY.

Nitrogenous Manures.

The general indications are that, at equivalent nitrogen doses :—

i. Sodium nitrate was not quite as efficient as ammonium sulphate or calcium cyanamide, but it was least unsatisfactory on the pegassy clay where, in combination with ammonium sulphate, it tended to be better than the latter alone;

ii. Calcium cyanamide was slightly inferior to ammonium sulphate on flood-fallowed frontland, slightly superior to it on pegassy clay and, on both soil types, somewhat better than sodium nitrate.

It is not clear why sodium nitrate is not generally a satisfactory substitute for ammonium sulphate on the Colony's rather acid soils, but there are indications that it may prove useful on the pegassy clay in combination with ammonium sulphate.

It would appear that calcium cyanamide will have the same effect as ammonium sulphate if the dressings are made correctly, *i.e.*, at the right time, the pellets scattered and the application covered with soil immediately. Unfortunately, war conditions have retarded shipments and labour shortage has often precluded covering. In such conditions, ammonium sulphate is preferable, its effects being more consistent even when the normal routine is upset.

Phosphatic Manures.

It has been established that few areas in the flood-fallowed frontland will respond to phosphates and that it is not yet possible to determine by analysis which they are (since response does not appear to be related to the 'available phosphate content' as determined by the accepted methods); further, that placement of the fertilizer, whether on the surface or at a depth of nine inches below, is not the determining factor. Nevertheless, phosphatic manuring can be advised for certain areas at Providence (Berbice), Blairmont and Bath.

On a number of pegassy areas at Cane Grove, Wales, Leonora and Uitvlugt, phosphate dressings are likely to yield handsome increments.

Pulverized rock phosphate, basic slag, Nicifos and superphosphate appear to be equally efficient as sources of phosphate.

There is evidence that fields which respond to phosphate are also likely to respond to calcium and that there is an interaction between the two elements. In such cases, the relative costs of the amendments should determine whether high phosphate alone or high calcium alone should be used, or

whether moderate doses of the two should be combined, but there is a tendency for the yield to be depressed if both elements are used at the higher levels.

With the co-operation of Mr. L. S. Birkett, Chemist at Pln. Blairmont, it has been established that the juice from phosphate-treated plots definitely contains more phosphate than that from control plots.

Potassic Manures.

Definite responses have been secured from potassic dressings at Blairmont (26 Rp.) and on pegassy clay at Uitvlugt, and significant interactions have been observed between this element and the three others (nitrogen, phosphate and calcium). There was a tendency for potash alone or calcium alone to be better than a combination of the two, and for a combination of medium nitrogen with medium potash to be better than high nitrogen alone or high potash alone, or than the two together at high levels.

Liming Materials.

There is not yet any evidence from the long-term trials, that moderate dressings of liming materials on flood-fallowed frontland at each replanting affect the yield of cane, or from other tests that heavy dressings can be advised for this soil type generally, but at Blairmont (26 Rp.) and on certain pegassy soils calcium has given yield increases and significant interactions with other elements (see under phosphatic and potassic manures, above).

Organic Manures.

Dressings of 12–15 tons/acre of pen manure and of filterpress cake can replace the normal ammonium sulphate application (2 cwt./acre) to plant canes and have a residual effect which, generally, will permit a reduction of one to two cwt./acre in the normal ratoon dressing of ammonium sulphate.

Molasses has given very satisfactory results with plant canes on unflooded pegassy clay, when applied some weeks before replanting, and on third ratoons on flood-fallowed frontland and flood-fallowed pegassy clay. In the case of the plant canes on unflooded pegassy clay, dressings of 6.6 tons/acre of molasses alone can be advised. In the case of the ratoons, on both soil types, five tons acre of molasses with two cwt./acre of ammonium sulphate can be advised in place of four cwt./acre of ammonium sulphate.

THE VARIETY AND FERTILIZER POSITION OF THE SUGAR INDUSTRY, IX.

BY

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VARIETAL COMPOSITION OF THE 1943 AND 1944 HARVESTS.

Table I, compiled from returns kindly furnished by the sugar estates, shows the relative importance, by area, of the varieties composing the 1943 and 1944 crops. No variety returns are available from the small cane farmers, who supply about two per cent. of the Colony's output, but it is known that they plant mainly P.O.J. 2878 and Diamond 10.

TABLE I.—**Percentage Distribution of the Varieties Reaped in 1943 and to be Reaped in 1944.**

Variety.	Total English Acres in the Colony.		Percentage in West Demerara.	Percentage along Demerara River Banks	Percentage in East Demerara.	Percentage in Berbice.
	1943					
P.O.J. 2878	46,178.74	(68.0%)	12.5	6.1	31.5	49.9
Diamond 10	18,023.03	(26.5%)	17.9	54.0	14.1	14.0
D. 166/34	1,099.63	(1.6%)	18.6	51.2	13.3	16.9
Co. 419	896.30	(1.3%)	32.7	21.8	17.6	27.9
Other Canes	1,747.65	(2.6%)	6.8	47.8	11.8	33.6
	67,945.35	(100.0%)				
	1944					
P.O.J. 2878	40,052.71	(65.1%)	12.2	5.8	30.1	51.9
Diamond 10	15,696.07	(25.5%)	14.5	58.4	13.3	13.8
D. 166/34	1,337.35	(2.2%)	13.6	42.8	18.7	24.9
Co. 419	1,826.94	(3.0%)	37.1	10.5	22.8	29.6
Co. 421	1,014.86	(1.6%)	13.5	10.4	14.3	61.8
Other Canes	1,609.90	(2.6%)	6.9	45.1	14.5	33.5
	61,537.83	(100.0%)				

The total area for 1943 was 738 acres less than for 1942 and that for 1944 is 6,408 acres less than for 1943. The decline is partly attributable to severe floods in certain areas in late 1942 and early 1943, but mainly to a decline in the number of labourers offering their services and a reduction in the average attendance of workers.

As a result of the labour shortage, 36.4 per cent. of the acreage to be harvested in 1944 has not been tilled.

The percentage of P.O.J. 2878, which reached a peak of 68.8 in 1942, has commenced to decline, while that of Diamond 10 has continued the downward trend started in 1940. Between them these two canes occupied 96.9 per cent. of the cane area in 1942, 94.5 per cent. in 1943 and 90.6 per cent. in 1944. They are gradually being replaced by varieties which have been recommended for extension as a result of their performance in the variety trials.

In 1942 no one cane, other than P.O.J. 2878 and Diamond 10, covered a sufficient area to be shown separately, but in 1943 two such emerged, and by 1944 there are three. All three are descendants of P.O.J. 2878, one bred locally and two in India, and are likely to expand still further.

The main contributors to "Other Canes" in the two years are as shown in Table II.

TABLE II.—**Acreages of the Varieties Constituting "Other Canes."**

Variety.	English Acres.		Variety.	English Acres.		Variety.	English Acres.	
	1943	1944		1943	1944		1943	1944
S.C. 12/4	227	363	Co. 421	161	1,015	D. 450/33	58	28
D. 625	238	3	Co. 213	164	132	D. 14/34	16	153
D. 66/30	187	177	D. 456/33	108	92	D. 14/33	4	78
D. 49/30	129	194	D. 419/33	106	162	Diamond 201	24	54

Table III shows the varietal changes which have taken place in recent years.

TABLE III.—**Comparison of Areas Under Various Canes in British Guiana, 1937-1944.**

Variety.	Per Cent. of Total Area in the Colony.							
	1937	1938	1939	1940	1941	1942	1943	1944
D. 625	33.0	20.6	8.0	2.8	0.6	—	—	—
"Mixed"	8.8	4.0	0.8	0.6	0.2	—	—	—
Diamond 10	36.6	41.3	43.5	37.1	31.1	28.1	26.5	25.5
P.O.J. 2878	19.2	31.7	45.7	57.6	66.0	68.8	68.0	65.1
D. 166/34	—	—	—	—	—	—	1.6	2.2
Co. 419	—	—	—	—	—	—	1.3	3.0
Co. 421	—	—	—	—	—	—	—	1.6
Other Canes	2.4	2.4	2.0	1.9	2.1	3.1	2.6	2.6

CYCLE AGE OF THE CROPS.

Table IV shows the cycle age of the crops from 1942 to 1944.

TABLE IV.—**Cycle Age of the Crops, 1942-1944.**

Category	Percentage in			Category	Percentage in		
	1942	1943	1944		1942	1943	1944
Plants	29.4	22.4	17.4	Third Ratoons	15.5	16.7	20.7
First Ratoons	23.7	29.2	24.4	Fourth Ratoons	5.6	6.1	6.3
Second Ratoons	24.5	24.4	28.2	Fifth Ratoons	1.3	1.2	3.0

It will be seen that, apart from the marked decline in total acreage mentioned above, the effect of the labour situation has been to reduce the percentage of plants, increase that of ratoons and extend the ratooning cycle, a combination of factors which must be regarded with apprehension by those who are interested.

COMMERCIAL YIELDS.

In Table V the weighted mean yields of the various canes for 1941 to 1943 are presented. As in the past, they demonstrate the superiority of P.O.J. 2878 over Diamond 10 and indicate that there are some promising kinds among the newer seedlings. Undue importance should not be given to the order of merit in the Table when only small acreages have been harvested, for the yield depends largely on site and season which may have been anything but average where a small area is involved.

FERTILIZERS IN 1942 AND 1943.

Table VI is adapted from the Reports of the Comptroller of Customs and shows the fertilizer imports for the past six years. There has obviously been a very marked decline in the fertilizer imports which must be attributed entirely to war conditions affecting supplies and shipping. It is quite impossible to maintain yields at the normal level with such inadequate supplies of fertilizer and the cumulative effect of their shortage, the labour conditions mentioned above and the floods of late 1942 and early 1943 will be disastrous in 1944.

The sugar estates have kindly supplied details of the various manures used, and the data for 1941-1943 are summarised in Table VII. The returns show that, of the area to be harvested in 1944, 24 per cent. received no fertilizer and 36.5 per cent. only received a part of the normal dressing.

TABLE V.—Weighted Mean Commercial Yields under Estate Conditions, 1941-43.

Variety.	Acres Harvested.	Crusher Juice		Fibre % Cane.	Tons 96° Sugar per Acre*
		Pol. %	Purity.		
		Plant	*Canes.*		
D. 66/30	156.4	14.80	84.16	—	4.16
S.C. 12/4	223.4	—	—	—	3.75
P.O.J. 2878	28,103.7	14.59	83.38	15.77	3.64
D. 456/33	32.1	14.40	83.04	12.75	3.59
Diamond 10	13,518.2	14.41	81.90	14.03	3.45
Co. 419	862.2	13.12	80.41	13.15	3.44
D. 166/34	949.9	13.82	82.34	12.51	3.32
Co. 213	106.9	11.77	79.23	12.95	3.18
D. 49/30	89.3	15.04	87.35	12.71	3.12
		First	*Ratoons.*		
D. 66/30	134.0	15.54	84.85	—	3.48
P.O.J. 2878	31,281.2	14.79	83.43	16.23	3.16
Co. 213	129.2	12.40	80.22	13.77	2.99
S.C. 12/4	412.8	15.62	88.80	13.00	2.96
Diamond 10	14,186.7	14.60	83.29	14.31	2.93
D. 166/34	447.0	15.28	84.98	13.54	2.91
D. 49/30	159.6	14.54	84.37	12.57	2.83
D. 456/33	90.1	14.14	80.87	12.21	2.67
D. 450/33	80.8	14.53	83.67	12.95	2.67
		Second	*Ratoons.*		
Co. 213	90.6	13.20	81.31	12.09	3.01
P.O.J. 2878	28,142.6	14.54	82.78	17.41	2.88
D. 66/30	130.8	15.49	85.66	12.58	2.79
Diamond 10	14,898.8	14.31	82.21	14.47	2.66
D. 49/30	141.4	15.02	86.62	12.84	2.54
S.C. 12/4	388.4	15.48	89.00	12.00	2.48
D. 456/33	89.0	14.43	82.73	13.03	2.30
		Third	*Ratoons.*		
D. 66/30	59.0	15.21	84.44	—	2.73
P.O.J. 2878	19,810.6	15.38	84.84	16.11	2.70
Diamond 10	6,856.3	14.17	81.05	15.80	2.67

* Undue importance should not be attached to the order of merit when only a small acreage has been harvested.

TABLE VI.—Fertilizers Imported into British Guiana in Recent Years.

Years.	Nitrogenous Fertilizers (almost entirely Ammonium Sulphate Prior to 1940).			Manurial Lime and Limestone.			Other Fertilizers (mainly Superphosphate and Basic Slag with some Potassium Sulphate).			Total Imports.	
	Tons.	Value $	Value per Ton, $	Tons.	Value $	Value per Ton, $	Tons.	Value $	Value per Ton, $	Tons.	Value $
1938	10,205	356,068	34.89	3,755	27,131	7.23	2,199*	46,821*	21.29	16,159	430,020
1939	11,720	401,847	34.29	4,795	33,609	7.01	2,033*	42,838*	21.07	18,548	478,294
1940	17,179†	1,000,526†	58.24	5,585	41,915	7.50	1,809*	54,429*	30.09	24,573	1,096,870
1941	8,315†	592,555†	71.26	9,012	70,934	7.87	203	6,893	33.96	17,530	670,382
1942	6,040†	553,161†	91.58	5,642	61,810	10.96	301*	15,454*	51.34	11,983	630,425
1943	2,051†	185,042†	90.22	1,015	14,787	14.57	22*	949*	43.14	3,088	200,778
Mean	9,252	514,866	55.65	4,967	41,698	8.39	1,094	27,897	25.50	15,313	584,461
% of Mean Annual Imports:	60.42	88.09		32.44	7.14		7.14	4.77			

*Includes
1938: 234 tons of Potassium Sulphate, valued at $10,196 or $43.57 per ton.
1939: 96 „ „ „ „ „ „ „ $ 4,155 or $43.28 per ton.
1940: 42 „ „ „ „ „ „ „ $ 2,795 or $66.55 per ton.
1942: All Superphosphate of Lime.
1943: All Pulverized Rock Phosphate.

†Includes
1940: 1,001 tons of Sodium Nitrate, valued at $ 50,979 or $ 50.93 per ton.
1941: 5,000 „ „ Cyanamide, „ „ $381.873 or $ 76.37 per ton.
1942: 4,550 „ „ „ „ „ $406.938 or $ 89.44 per ton.
„ : 1,306 „ „ Ammonium Chloride „ „ $134.426 or $102.93 per ton.
1943: 1,339 „ „ Cyanamide „ „ $112.709 or $ 84.17 per ton.
„ : 706 „ „ Ammonium Chloride „ „ $ 71.587 or $101.40 per ton.
„ : 5 „ „ „ Nitrate „ „ $ 631 or $126.20 per ton.
„ : 1 ton of Potassium Nitrate „ „ $ 115 or $115.00 per ton.

TABLE VII.—Values and Quantities of Fertilizers Used on British Guiana Sugar Estates, 1941–1943.

Fertilizer.	Value, $			Per cent. of Total Value.			Per Ton, $			Quantity, Tons.			Per cent. of Total Quantity.		
	1941	1942	1943	1941	1942	1943	1941	1942	1943	1941	1942	1943	1941	1942	1943
Ammonium Sulphate	606,229.04	253,757.36	34,505.41	70.2	30.3	5.6	70.65	79.68	80.46	8,580.58	3,184.67	428.87	43.9	23.2	6.2
Calcium Cyanamide	137,078.74	472,809.88	377,444.11	15.9	56.4	60.8	86.70	100.18	106.63	1,580.99	4,719.37	3,539.65	8.1	34.4	51.0
Sodium Nitrate	13,654.17	192.60	...	1.6	...	...	65.19	65.29	...	209.45	2.95	...	1.1	...	...
Basic Slag	6,169.98	58.18	...	0.7	...	...	29.94	38.79	...	206.10	1.50	...	1.0	...	...
Superphosphate	11,748.23	7,475.94	3,884.43	1.3	0.9	0.6	32.53	40.31	58.41	361.10	185.45	66.50	1.8	1.4	1.0
Limestone	85,394.82	63,714.93	23,073.30	9.9	7.6	3.7	10.04	12.01	16.64	8,507.45	5,304.22	1,386.82	43.6	38.7	20.0
Potassium Sulphate	...	...	222.20	...	...	...	...	...	55.55	...	...	4.00	...	...	...
Rock Phosphate	1,517.68	...	...	0.2	...	...	28.77	...	...	52.75	...	...	0.3	...	...
Ammonium Chloride	...	40,150.25	181,560.23	...	4.8	29.3	...	128.80	120.37	...	311.72	1,508.34	...	2.3	21.8
Ammonium Nitrate	...	...	106.42	...	...	...	...	...	147.81	...	...	.72	...	...	...
Miscellaneous	2,087.62	...	...	0.2	...	...	...	...	...	32.90	...	...	0.2	...	...
TOTAL	863,880.28	838,124.14	620,796.10	100.0	100.0	100.0	...	...	...	19,531.32	13,709.88	6,934.90	100.0	100.0	100.0

LABOUR INVESTIGATIONS

BY

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Attention has been drawn in other papers in this Bulletin to the serious labour shortage which the sugar industry has been experiencing, and to the disastrous effects that shortage has had on the cane breeding, the research work, the expansion of new varieties, the total area in cane, the proper balance of the crop cycle and the yield per acre.

As a foundation on which to base consideration of any possible remedial measures, a certain amount of factual data has been collected at the request of the Sugar Experiment Stations' Committee and the two notes which follow are in the nature of a progress report pending further work in this direction.

The writer desires to thank the Managers of the Estates for their kind co-operation, the Staff of the Sugar Experiment Station for its unstinting assistance, and Mr. H. D. Huggins, Agricultural Economist, for his helpful suggestions.

ATTENDANCE OF RESIDENT FIELD PIECE WORKERS AT PLN. LA BONNE INTENTION.

Through the courtesy of the Manager of Pln. La Bonne Intention, it has been possible to examine one paylist each for residents in the following categories : Shovelmen, Female Weeders, 'Boys' (young men). From these, the number of days worked each week for the calendar year 1941 and the year July 1942 to June 1943 were extracted for each worker whose name appeared on the paylist throughout one of the periods mentioned and who was mainly engaged as a field piece worker.

The information has been summarised in the Tables which follow, and attention is drawn to the following points :—

1. In all three categories it was possible to find, in 1941, a greater number of workers, than in 1942–43, whose names appeared in the paylist throughout the respective periods. This suggests that more people were offering their services during 1941 than during 1942–43.

2. The names of two female weeders who did not work at all for the year appeared throughout 1941. By 1942-43 the number of such names had risen to 22. These two groups were, however, omitted in arriving at the tabular data which follow (except in Table V), else average attendance, etc., of female weeders would have appeared even worse than the Tables now show.

3. There was in each category, a marked tendency to work less days per annum in 1942-43 than in 1941.

4. The attendance of the average worker of each group in 1942-43 may be expressed as a percentage of the corresponding figure for 1941 as follows :

Category.	Days Worked 1942-43 % Days Worked 1941.
Shovelmen	85.96
Female Weeders	53.27
Boy Gang	88.10

5. There was some tendency for the individual worker to shorten his week in 1942-43, but much of the falling-off in days worked must be attributed to an increase in the number of weeks when the worker was entirely absent.

6. Table VI shows that none of the groups studied worked as much as half of the possible working days in 1942-43, and that even if deductions are made from the possible days to permit of rice cultivation, etc., no group worked 61 per cent. of the remaining days.

TABLE I.—**Attendance of Piece Work Shovelmen at Pln. La Bonne Intention.**

Year.	No. Studied.	Mean No. Days Worked per Year.	Percentage of Labourers who Worked (in Days).		
			75 and under	76 to 150	151 to 250
1941	134	136.8	8.96	53.73	37.31
1942-43 (1)	100	117.6	17.00	61.00	22.00

(1) Year, July 1942 to June 1943.

TABLE II.—**Attendance of Piece Work Female Weeders at Pln. La Bonne Intention.**

Year.	No. (1) Studied.	Mean No. Days Worked per Year.	Percentage of Weeders who Worked (in Days).		
			50 and under	51 to 125	126 and over
1941	75	85.6	21.33	62.67	16.00
1942-43 (2)	66	45.6	59.09	39.40	1.51

(1) The names of a further 2 persons who did not work at all in 1941 and of 22 who did not work in 1942-43, but which appeared on the pay lists throughout the respective periods, have been omitted in arriving at this table.

(2) Year, July 1942 to June 1943.

TABLE III.—**Attendance of "Boy Gang" Piece Workers at Pln. La Bonne Intention**

Year.	No. Studied.	Mean No. of Days Worked per year.	Percentage of Labourers who Worked (in Days).		
			26 to 125	126 to 225	226 and over.
1941	72	147.52	40.28	47.22	12.50
1942-43 (1)	69	129.96	50.72	43.48	5.80

(1) Year, July 1942 to June 1943.

TABLE IV.—**Attendance of Piece Workers at Plantation La Bonne Intention.**

Type of Worker.	Period.	Percentage working, per annum.	
		100 Days and Under	Over 100 Days
Shovelmen	1941	20.15	79.85
	July 1942—June 1943	41.00	59.00
Female Weeders	1941	57.33	42.67
	July 1942—June 1943	84.85	15.15
Boy Gang	1941	27.78	72.22
	July 1942—June 1943	37.68	62.32

TABLE V.—Frequency Distribution of Working Days per Week of Resident Piece Workers at Pln. La Bonne Intention.

No. of Days per Week	Shovelmen				Female Weeders (1)				Boy Gang			
	% All Weeks		% 'Working' Weeks Only		% All Weeks		% 'Working' Weeks Only		% All Weeks		% 'Working' Weeks Only	
	1941	1942-43 (2)	1941	1942-43 (2)	1941	1942-43 (2)	1941	1942-43 (2)	1941	1942-43 (2)	1941	1942-43 (2)
0	28.30	35.13	—	—	45.00 (3)	78.88 (3)	—	—	31.15	33.61	—	15.16
0.5—1	2.93	5.52	4.09	8.52	0.97	0.86	1.77	4.08	3.77	5.80	5.48	18.18
1.5—2	8.03	9.34	11.20	14.40	13.91	3.12	23.65	14.76	7.96	10.96	10.25	—
2.5—3	16.87	15.00	23.53	23.12	21.05	8.14	38.27	38.53	10.94	12.07	15.88	8.73
3.5—4	20.00	16.00	27.89	24.67	16.77	6.94	30.49	32.88	16.04	14.91	23.30	22.46
4.5—5	14.80	10.61	20.64	16.36	3.20	2.04	5.82	9.63	9.68	9.64	14.06	14.53
5.5—6	9.05	8.05	12.63	12.40	0.00	0.02	0.00	0.12	21.28	13.57	30.91	20.44
6.5—7	0.02	0.35	0.02	0.53	0.00	0.00	0.00	0.00	0.08	0.34	0.12	0.50

(1) The names of 2 persons who did not work at all in 1941 and of 22 who did not work in 1942-43, but which appeared on the paylists throughout the respective periods, have been included in arriving at the figures in columns 6—9.

(2) Year, July 1942 to June 1943.

(3) 25.21% of all "non-working" weeks in 1941 and 25.32% of those of 1942-43 are attributed in the paylists to "pregnancy" or "nursing." These two reasons for absence accounted for 11.35% and 19.97% of all female weeders' week in 1941 and 1942-43 respectively.

TABLE VI.—**Comparison of the Actual with the Possible Attendance of Resident Piece Workers at Pln. La Bonne Intention.**

	Class of Worker.		
	Shovel-men.	Female Weeders.	Boy Gang.
Possible Days per Annum (assuming a 5.5 day week and excluding public holidays)	275	275	275
Actual Average Attendance, 1942–43	118	46	130
% Attendance on Possible Days, 1942–43	42.91	16.73	47.27
Estimated Deductions from "Possible Days" which may Reasonably be made for Rice, Domestic and Private Duties, Vacations, etc.	60	105 (1)	60
Probable Days left for Working	215	170	215
% Attendance on Probable Days, 1942–43	54.88	27.06	60.47

(1) Pregnancy and nursing occupied 16% of all the possible working weeks of Female Weeders in 1941 and 1942-43. 45 working days have therefore been allowed for this on the average. As many women will bear no child in any given year, the time available for the actual child-bearers will, of course, be much greater than this mean figure suggests.

THE LABOUR DAY REQUIREMENTS OF THE BRITISH GUIANA SUGAR INDUSTRY.

With the kind co-operation of the Managers concerned, an attempt has been made to estimate the labour force needed for the British Guiana sugar industry by collecting and analysing statistics from nine estates (*viz.*, Skeldon, Port Mourant, Albion, Providence (Berbice), Bath, Providence (Demerara), Farm, Diamond and Leonora) and from the six factories which mill their canes.

For the reasons that it was a fairly normal year in many respects and that the labour picture was then uncomplicated by unusual absenteeism, the grow-more-food campaign, animal husbandry or rubber production, 1941 was chosen. On the other hand, all the Colony's estates did not keep an attendance roll of non-resident labour as far back as 1941, but the estates selected, represent 47.16 per cent. of the 1941 sugar production on estates and 43.66 per cent. of the estate area reaped, are spread throughout the sugar belt and include properties managed by all the maior concerns. They are considered a satisfactory sample from which certain deductions for the Colony as a whole may be drawn.

It is hoped later to submit the data to closer scrutiny and to fit the findings into the general picture of the labour situation which emerges when other aspects of the enquiry are completed, but as it is understood that there is a demand for such information as may be already available, the following Tables are submitted.

In considering the Tables, the following points should be borne in mind :

1. Managers, Chemists, Engineers and Overseers were not considered, but all other employees of the estate have been, including domestics employed by the Management and Staff.
2. All phases of production and manufacture were included, but transport of the manufactured product was excluded.
3. The dividing line between Field and Factory was not quite the same in all estate records, and in some instances it was difficult to arrive at an accurate figure for labour days on such contract items as burning earth and constructing dwellings.
4. It was, unfortunately, necessary to establish a mixed category of Residents and Non-Residents. It may safely be said, however, that the majority of the labour days under this head were furnished by Residents.
5. All Factory labour days are shown as Adult days because the records, in most instances, did not permit a satisfactory separation of Juveniles and Adults. However, a small portion of the Factory days are, in fact, furnished by Juveniles, and to judge from two factories where it was possible to separate them, they amount to about 7.7 per cent. of the total Factory days.

Tables VII and VIII show the distribution of Field labour days between the Sexes, between Residents and Non-Residents and between Piece and Time workers on the various estates. It will be seen that :

1. Residents supply from less than 20 per cent. (Providence, Berbice) to 100 per cent. (Diamond and Farm) of the labour force.
2. Males supply 68 per cent. of the labour days, females 24 per cent. and Juveniles 8 per cent. Providence (Demerara), Farm, Diamond and Leonora have a higher proportion of female days than have the other estates.
3. About one-third of the male and one-quarter of the female days are contributed by Time workers; all the Juvenile days being, of course, Time days as well.

The records permitted the classification of Resident Male Piece Workers into 'Shovelmen' and 'Male Weeders'. The 'Shovelmen' amounted to 64 per cent. of the total for all estates.

Table IX indicates considerable variation in the Field labour days per ton of sugar from estate to estate for all categories of labourers; the Male days varying from 14.1 (Albion) to 26.4 (Diamond); the Female days from 3.6 (Skeldon) to 11.7 (Diamond); and the Juvenile days from 0.2 (Providence, Berbice) to 4.1 (Bath). Similarly, the Piece days per ton of

sugar vary from 15.4 (Albion) to 23.7 (Leonora), and the Time days from 5.2 (Albion) to 17.2 (Diamond). On the whole, the Field labour days tended to be lowest at Albion and highest at Providence (Demerara), Farm, Diamond and Leonora. It is known that these four Sandbach, Parker estates frequently till both banks in ratoon cane, as compared with the one bank normally tilled on other properties, but, on the other hand, one might expect such extra labour requirements to be offset, at least in part, by the fact that more 'chopping and planting' is done and more mechanical tillage performed on the Sandbach, Parker estates. Factory labour days per ton sugar tend to be more stable from factory to factory, and none of the factories deviates from the general mean by more than 1.2 Male days or 0.4 Female days.

Table X demonstrates that there is a definite periodic fluctuation in the Industry's demand for labour, and from Tables IX and X it has been possible to construct Table XI to express this demand in terms of Men, Women and Juveniles for months of different numbers of working days. Attention is drawn to the fact, however, that Table XI assumes that the periodic fluctuations in the total labour day requirements apply to all categories of labour (Males, Females, Juveniles, Piece and Time) in the same proportion.

TABLE VII.—Percentage Distribution of Field Labour Days Between the Sexes, Residents and Non-Residents, and Piece and Time Workers in 1941.

ESTATE.	RESIDENTS.				NON RESIDENTS.				RESIDENT & NON-RESIDENT WORKERS. *				ESTATE.
	Males.		Females.		Males.		Females.		Superintendents, Artisans, Porters, Contractors, Medical, Clerical, etc.		Juveniles	Total.	
	Piece.	Time.	Piece.	Time.	Piece.	Time.	Piece.	Time.	Males.	Females.			
Skeldon	22.74	12.31	10.09	.14	31.08	.49	4.97	...	14.61	..	3.57	100.00	Skeldon
Port Mourant	24.55	19.21	16.19	1.80	22.02	.46	4.72	.11	...	...	10.94	100.00	Port Mourant
Albion	42.16	14.03	16.87	3.85	12.49	...	3.05	...	...	...	7.55	100.00	Albion
Providence, Berbice	7.87	5.55	2.62	.87	44.42	6.05	11.75	6.97	12.85	.21	.84	100.00	Providence, Berbice
Bath	22.76	9.14	8.43	2.52	21.70	1.72	2.68	.92	14.82	1.22	14.09	100.00	Bath
Providence, Demerara	24.89	9.58	13.71	5.95	14.57	...	4.54	...	13.68	2.81	10.27	100.00	Providence, Demerara
Farm	37.78	21.35	21.30	9.39	...	...	...	...	...	...	10.18†	100.00	Farm
Diamond	41.31	24.79	15.60	13.74	...	...	...	...	...	...	4.56†	100.00	Diamond
Leonora	25.67	10.75	16.91	3.22	14.87	1.24	4.87	.43	10.36	3.52	8.16†	100.00	Leonora
All the above Estates	28.59	14.60	14.29	4.52	17.17	.86	4.00	.63	6.64	.97	7.73	100.00	All the above Estates
Skeldon	35.05		10.23		31.57		4.97		14.61	...	3.57	100.00	Skeldon
Port Mourant	43.76		17.99		22.48		4.83			...	10.94	100.00	Port Mourant
Albion	56.19		20.72		12.49		3.05			...	7.55	100.00	Albion
Providence, Berbice	13.42		3.49		50.47		18.72		12.85	.21	.84	100.00	Providence, Berbice
Bath	31.90		10.95		23.42		3.60		14.82	1.22	14.09	100.00	Bath
Providence, Demerara	34.47		19.66		14.57		4.54		13.68	2.81	10.27	100.00	Providence, Demerara
Farm	59.13		30.69		...		...		...	...	10.18†	100.00	Farm
Diamond	66.10		29.34		...		...		..	...	4.56†	100.00	Diamond
Leonora	36.42		20.13		16.11		5.30		10.36	3.52	8.16†	100.00	Leonora
All the above Estates	43.19		18.81		18.03		4.63		6.64	.97	7.73	100.00	All the above Estates
Skeldon		45.28				36.54				18.18		100.00	Skeldon
Port Mourant		61.75				27.31				10.94		100.00	Port Mourant
Albion		76.91				15.54				7.55		100.00	Albion
Providence, Berbice		16.91				69.19				13.90		100.00	Providence, Berbice
Bath		42.85				27.02				30.13		100.00	Bath
Providence, Demerara		54.13				19.11				26.76		100.00	Providence, Demerara
Farm		89.82				...				10.18†		100.00	Farm
Diamond		95.44				...				4.56†		100.00	Diamond
Leonora		56.55				21.41				22.04		100.00	Leonora
All the above Estates		62.00				22.66				15.34		100.00	All the above Estates

*Mainly Resident Time Workers, but including a small proportion of Non-Residents and Piece Workers. †All Residents.

TABLE VIII.—Distribution of Field Labour Days, Irrespective of Residence, in 1941.

ESTATE.	MALES.			FEMALES.			All Piece Workers	All Time Workers	Juveniles
	Piece	Time	Total	Piece	Time	Total			
Skeldon	53.82	27.41	81.23	15.06	0.14	15.20	68.88	27.55	3.57
Port Mourant	46.57	19.67	66.24	20.91	1.91	22.82	67.48	21.58	10.94
Albion	54.65	14.03	68.68	19.92	3.85	23.77	74.57	17.88	7.55
Providence, Berbice	52.29	24.45	76.74	14.37	8.05	22.42	66.66	32.50	0.84
Bath	44.46	25.68	70.14	11.11	4.66	15.77	55.57	30.34	14.09
Providence, Demerara	39.47	23.26	62.73	18.25	8.75	27.00	57.72	32.01	10.27
Farm	37.78	21.35	59.13	21.30	9.39	30.69	59.08	30.74	10.18
Diamond	41.31	24.79	66.10	15.60	13.74	29.34	56.92	38.52	4.56
Leonora	40.54	22.35	62.89	21.78	7.17	28.95	62.32	29.52	8.16
All the above Estates	45.76	22.10	67.86	18.29	6.12	24.41	64.05	28.22	7.73

TABLE IX.—**Distribution of Labour Days per Ton Sugar Made and per English Acre Reaped, 1941.**

ESTATE.	FIELD.										FACTORY.*				FIELD & FACTORY.					
	Male Days per		Female Days per		Juvenile Days per		Piece Work Days per		Time Work Days per		Male Days per		Female Days per		Male Days per		Female Days per		Juvenile Days per	
	Ton.	Acre.	Ton.	Acre.	Ton.	Acre.	Ton.	Acre.	Ton.	Acre.	Ton.	Acre.	Ton.	Acre.	Ton.	Acre.	Ton.	Acre.	Ton.	Acre.
Providence, Berbice	22.8	75.8	6.7	22.1	0.2	0.8	19.8	65.8	9.9	32.9	5.2	15.9	0.5	1.5	27.0	83.4	6.2	19.2	2.1	6.4
Bath	20.6	59.2	4.6	13.3	4.1	11.9	16.3	46.9	13.0	37.5										
Skeldon	19.5	69.0	3.6	12.9	0.9	3.0	16.5	58.5	7.5	26.4	6.8	24.0	0.3	1.1	26.3	93.0	3.9	14.0	0.9	3.0
Diamond	26.4	78.3	11.7	34.8	1.8	5.4	22.7	67.4	17.2	51.1										
Farm	18.4	57.0	9.6	29.6	3.2	9.8	18.4	56.9	12.7	39.4	5.6	16.6	0.4	1.2	28.4	84.7	10.8	32.1	2.8	8.4
Providence, Demerara	22.2	64.5	9.5	27.8	3.6	10.6	20.4	59.3	14.9	43.5										
Port Mourant	16.4	64.3	5.6	22.1	2.7	10.6	16.7	65.5	8.0	31.6	6.3	25 0	0.4	1.7	22 7	89.3	6.0	23.8	2.7	10.6
Albion	14.1	45.4	4.9	15.7	1.6	5.0	15.4	49.2	5.2	16.8	7.1	22.8	0.9	2.9	21.2	68.2	5.8	18.6	1·6	5.0
Leonora	23.9	66.3	11.0	30.5	3.1	8.6	23.7	65.7	14.3	39.7	7.6	21.1	0.7	2.0	31.5	87.4	11.7	32.5	3.1	8.6
All Estates	19.6	63.1	7.0	22.7	2.2	7.2	18.5	59.5	10.4	33.4	6.4	20.5	0.5	1.7	26.0	83.5	7.5	24.4	2.2	7.2

*Some Juveniles are employed in the factories but it was not possible to separate them in all instances. In two cases where it could be done satisfactorily, Juvenile Days averaged 7.70% of the total labour days for those factories.

TABLE X.—Actual Monthly Labour Requirements Expressed as a Percentage of Mean Monthly Labour Days for 1941.

Estate.		Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
Skeldon	Field	75.14	113.70	110.56	131.78	72.97	50.86	94.27	112.92	149.70	74.16	76.75	137.19
	Factory	86.70	116.08	99.21	142.68	73.22	87.88	63.25	127.41	128.40	77.94	70.42	126.81
	Field and Factory	77.77	114.24	107.97	134.27	73.03	59.29	87.21	116.22	144.84	75.02	75.32	134.82
Port Mourant	Field	95.31	124.93	100.81	96.70	147.50	101.38	81.83	60.08	99.35	118.45	74.92	98.74
	Factory	89.19	117.48	85.72	100.02	116.36	94.53	100.99	75.01	113.38	124.48	94.82	88.02
	Field and Factory	93.98	123.33	97.55	97.42	140.78	99.90	85.96	63.30	102.38	119.75	79.22	96.43
Albion	Field	119.33	121.66	107.14	93.04	78.82	67.98	75.68	106.04	152.99	90.96	67.29	119.07
	Factory	98.08	100.06	81.80	109.46	73.83	72.98	99.33	102.96	139.56	98.79	91.01	132.14
	Field and Factory	113.37	115.61	100.04	97.64	77.42	69.38	82.30	105.18	149.23	93.16	73.94	122.73
Providence and Bath	Field	84.89	102.96	120.77	119.72	101.36	87.12	96.36	93.11	124.97	62.50	88.65	117.59
	Factory	81.50	119.00	114.21	113.56	70.88	66.68	92.68	101.75	106.59	113.09	102.46	117.60
	Field and Factory	84.08	106.78	119.21	118.25	94.11	82.24	95.48	95.16	120.59	74.56	91.95	117.59
Providence, Farm and Diamond	Field	114.92	111.93	89.03	94.25	76.27	77.74	94.70	92.41	132.15	105.94	107.55	104.01
	Factory	102.59	110.52	65.69	100.02	66.67	58.47	81.06	80.79	101.27	173.01	140.04	119.87
	Field and Factory	113.17	111.73	85.72	95.07	74.90	75.00	92.76	90.76	127.75	114.70	112.17	106.27
Leonora	Field	82.32	114.75	103.69	92.88	107.94	83.73	97.93	102.62	117.58	98.88	89.43	108.25
	Factory	84.22	103.46	101.22	90.04	106.08	70.54	92.55	90.83	110.88	100.11	116.86	133.21
	Field and Factory	82.66	112.72	103.24	92.37	107.62	81.35	96.96	100.49	116.37	99.10	94.37	112.75
All the above Estates	Field	98.38	114.83	102.35	101.88	96.24	79.36	90.84	93.19	128.27	95.26	87.96	111.44
	Factory	91.93	110.08	88.02	107.94	84.80	75.09	89.07	94.79	117.53	117.35	103.93	119.47
	Field and Factory	97.13	113.91	99.58	103.05	94.03	78.53	90.50	93.50	126.19	99.53	91.05	113.00

TABLE XI.— **Labour Force Required to Grow and Manufacture 200,000 Tons of Sugar.**

MONTH.	LABOUR DAY REQUIREMENTS.			OFFERING EMPLOYMENT FOR								
				22 Days per month to			18 Days per month to			14 Days per month to		
	Males	Females	Juveniles	Males	Females	Juveniles	Males	Females	Juveniles	Males	Females	Juveniles
January	420,897	121,412	35,614	19,132	5,519	1,619	23,383	6,745	1,979	30,064	8,672	2,544
February	493,610	142,387	41,767	22,437	6,472	1,898	27,423	7,910	2,320	35,258	10,170	2,983
March	431,514	124,475	36,513	19,614	5,658	1,660	23,973	6,915	2,028	30,822	8,891	2,608
April	446,550	128,812	37,785	20,298	5,855	1,717	24,808	7,156	2,099	31,896	9,201	2,699
May	407,464	117,537	34,478	18,521	5,343	1,567	22,637	6,530	1,915	29,105	8,396	2,463
June	340,297	98,162	28,794	15,468	4,462	1,309	18,905	5,453	1,600	24,307	7,012	2,057
July	392,107	113,125	33,183	17,826	5,142	1,508	21,787	6,285	1,843	28,012	8,080	2,370
August	405,167	116,876	34,283	18,417	5,312	1,558	22,509	6,493	1,905	28,940	8,348	2,449
September	546,823	157,738	46,270	24,856	7,170	2,104	30,379	8,763	2,571	39,059	11,267	3,305
October	431,296	124,413	36,494	19,604	5,655	1,659	23,961	6,912	2,027	30,807	8,887	2,607
November	394,549	113,813	33,385	17,934	5,173	1,518	21,919	6,324	1,855	28,182	8,130	2,385
December	489,666	141,250	41,434	22,257	6,421	1,883	27,205	7, 848	2,303	34,977	10,089	2,959
Mean:	433,333	125,000	36,667	19,697	5,683	1,667	24,074	6,944	2,037	30,952	8,929	2,619

REPORT ON THE SUGAR EXPERIMENT STATIONS FOR THE YEAR 1943.

STAFF.

C. H. B. WILLIAMS, M.A., A.I.C.T.A., DIP. AGR.	*Sugar Agronomist and Plant Breeder.*
C. CAMERON	*Field Manager.*
E. I. HUGH, DIP. AGR.	*Field Assistant.*
G. R. DIAS	*Field Assistant.*
E. G. B. JONES, DIP. AGR.	*Field Assistant.*
H. B. SINGH	*Laboratory Assistant.*
G. W. P. ROBERTS	*Statistical Assistant.*
H. W. YHAP	*Statistical Assistant.*

2. Mr. Jones resigned on 31st March to take up an appointment as Agricultural Instructor, with the Department of Agriculture.

3. Mr. Hugh entered McGill University on leave of absence in September and resigned his post at the end of the year. Mr. Dias was promoted from Second Field Assistant to succeed Mr. Hugh.

4. Mr. Roberts resigned his post on November 4th to take up an appointment in the Economics Division of the Department of Agriculture and Mr. H. W. Yhap replaced him on December 1st.

5. Absences from duty during the year were as follows :—

	Casual Leave.	*Sick Leave.*	*Vacation Leave.*
Mr. Williams	—	—	8. II.—8. IV.
Mr. Cameron	9.—15. VIII and 13.—19. XII.	1.—6. II.	—
Mr. Hugh	—	26. I.—9. II.	1. X.—31. XII.
Mr. Singh	19. V.—6. VI.	—	—
Mr. Roberts	9. IV.—6. VI.	—	—

COMMITTEE.

6. The following members formed the British Guiana Sugar Experiment Stations' Committee for the year :—

THE DIRECTOR OF AGRICULTURE	*Chairman.*
MR. J. C. GIBSON	*Messrs. Booker Bros., McConnell & Co., Ltd.*
HON. M. B. G. AUSTIN, O.B.E.	*Messrs. Curtis, Campbell & Co., Ltd.*
MR. G. M. ECCLES	*Messrs. S. Davson & Co., Ltd.*
MR. G. H. HOLDEN	*Messrs. Sandbach, Parker & Co., Ltd.*
MR. C. H. PALMER	*Messrs. Booker Bros., McConnell & Co., Ltd.*
MR. R. F. MILNE	*Messrs. Booker Bros., McConnell & Co., Ltd.*

FINANCE.

7. The sum of $25,090 was voted from the funds of the Sugar Experiment Stations' Committee for the working of the Station during the year. The total spent was $24,595.15; the unexpended balance is mainly attributable to the shortage of labour.

8. Receipts from Assessments during the year amounted to $21,589.80, those from sale of canes to $3,525.65, while miscellaneous receipts totalled $199.64.

9. In addition to the amount spent from the funds of the Committee, $833.13 were spent from a special grant made for fertilizer research by the Chilean Nitrate Corporation. This sum, together with $1,044.38 spent in 1941 and 1942 make a total of $1,877.51 spent from this source to date.

EQUIPMENT.

10. Largely as a matter of economy, no major repairs or alterations were effected during the year and the buildings, paths, etc., are showing signs of wear and neglect. It is to be hoped that conditions may permit of the necessary action being taken in the near future. The handicaps of travel and transport under war conditions have been greatly accentuated by the loss, through theft, of the front wheels and tyres of the Station's truck.

CANE BREEDING AND INTRODUCTION.

11. Table I lists, under their year of production, the number of Demerara seedlings in field experiments and those under multiplication and selection.

TABLE I.—**Demerara Seedlings in Tests and Undergoing Multiplication, etc., December, 1943.**

Year.	Number of Seedlings.	
	In Test.	Under Multiplication, etc.
1933	2	—
1934	2	—
1936	3	—
1937	2	—
1938	8	1
1939	4	—
1940	12	15
1941	—	193
1942	—	21
Total	33	230

12. The breeding programme for 1943 was very greatly upset by labour shortages and frequent staff changes. The 1941 seedlings were so handicapped by unavoidable lack of weeding, etc., that the entire lot had to be extended again and their second selection postponed.

13. *The 1942 seedlings* have been subjected to their first selection, and 21 have been extended on frontland clay at Sophia. Table II shows that only 6,007 were basketed and about half that number transplanted to the field. As mentioned in the last Annual Report, labour difficulties had a very adverse effect on the breeding programme.

TABLE II.—**Crosses Attempted, Seedlings Selected, etc., 1942.**

Combinations.	No. of Arrows Used.	No. of Boxes Sown.	No. of Seedlings Basketed.	No. of Seedlings Planted in Field.	1st Selection.	
					No.	%
I. Interspecific Crosses.						
1. 3rd Nobilised Glagah :—						
P.O.J. 2364 x Diamond 10	2	1	20	8	1	12.50
2. 5th Nobilised Glagah :—						
Co. 421 x D. 552/33	2	1	12	12	—	—
„ x Diamond 10	10	7	16	8	—	—
„ x D. 72/35	2	3	20	8	—	—
M.P.R. 151 x Diamond 10	1	2	15	5	—	—
Total	15	13	63	33	—	—
3. 6th Nobilised Glagah :—						
D. 204/36 x Diamond 10	2	1	70	32	—	—
D. 4/40 x „	2	1	3	3	—	—
D. 6/40 x „	1	2	140	80	—	—
D. 7/40 x „	1	1	20	16	—	—
D. 8/40 x „	2	2	22	16	—	—
D. 9/40 x „	2	2	18	6	—	—
D. 11/40 x „	2	1	—	—	—	—
D. 12/40 x „	2	2	—	—	—	—
Total	14	12	273	153	—	—

TABLE II (Contd.).—**Crosses Attempted, Seedlings Selected, etc., 1942.**

Combinations.	No. of Arrows Used.	No. of Boxes Sown.	No. of Seedlings Basketed.	No. of Seedlings Planted in Field.	1st Selection.	
					No.	%
4. Glagah, Chunnee and Noble Combinations.						
B. 34104 x Co. 213	2	2	—	—	—	—
B. 34104 x Diamond 10	4	3	—	—	—	—
Co. 281 x „	4	5	72	48	2	4.17
„ x Co. 419	3	3	40	15	1	6.67
„ x D. 204/36	1	1	12	8	—	—
„ x D. 1/40	1	1	30	12	1	8.33
Co. 331 x Diamond 10	2	4	1,780	1,432	7	0.49
Co. 419 x D. 41/40	2	2	150	112	—	—
Co. 419 x Co. 290	2	1	10	3	—	—
Co. 419 x Co. 213	4	4	61	36	—	—
Co. 419 x Diamond 10	6	3	32	8	—	—
Co 419 x D. 552/33	4	4	203	60	2	3.33
Co. 421 x Co. 419	3	3	48	16	—	—
Co. „ x Co. 290	2	1	24	12	—	—
Co. „ x Co. 331	1	2	100	64	—	—
Co. „ x Co. 213	6	7	79	20	—	—
Co. „ x Co. 3/34	4	6	70	24	—	—
D. 14/23 x Diamond 10	6	2	80	30	—	—
D. 320/33 x „	4	2	—	—	—	—
D. 419/33 x „	4	1	—	—	—	—
D. 3/34 x Glagah Kloet	3	3	720	48	1	2.08
D. 14/34 x Diamond 10	6	3	33	7	—	—
D. 199/36 x „	6	2	—	—	—	—
D 200/36 x Co. 331	1	1	105	32	—	—
D. „ x Diamond 10	4	2	90	60	4	6.67
D. 33/37 x „	2	4	—	—	—	—
D. 54/38 x „	2	3	38	8	—	—
D. 3/39 x „	2	1	—	—	—	—
D. 5/39 x „	2	1	—	—	—	—
D. 7/39 x „	2	1	17	7	—	—
D. 9/39 x „	2	1	—	—	—	—
D. 10/39 x „	2	3	—	—	—	—
D. 17/39 x „	3	2	70	48	—	—
D. 1/40 x „	2	2	22	10	—	—
D. 3/40 x „	2	2	30	16	—	—
D. 21/40 x „	2	2	90	30	—	—
D. 1/41 x Glagah Kloet	3	5	420	96	—	—
D. 3/41 x Co. 213	2	5	—	—	—	—
„ x Diamond 10	2	3	—	—	—	—
M.P.R. 151 x Co. 213	2	4	7	—	—	—
P.O.J. 2364 x „	5	3	12	—	—	—
Total	122	107	4,445	2,262	18	0.80

TABLE II (Contd.)—**Crosses Attempted, Seedlings Selected, etc., 1942.**

Combinations.	No. of Arrows Used.	No. of Boxes Sown.	No. of Seedlings Basketed.	No. of Seedlings Planted in Field.	1st Selection.	
					No.	%
5. Other Combinations.						
D. 113/36 x Diamond 10	4	1	18	14	—	—
D. 15/40 x "	2	2	40	16	—	—
Total	6	3	58	30	—	—
II. Intergeneric Crosses.						
1. Primary Crosses.						
Co. 281 x Sorghum	1	1	7	2	—	—
Co. 281 x Colman Sorgo	1	1	100	80	—	—
Co. 421 x Sorghum	2	2	4	2	—	—
Diamond 10 x Sorghum	1	1	30	16	—	—
D. 3/34 x Sorghum	2	2	39	12	1	8.33
D. 3/34 x Colman Sorgo	2	2	200	24	1	4.17
Total	9	9	380	136	2	1.47
2. First Back Crosses.						
Co. 281 x D. 166/34	2	2	20	8	—	—
Co. 421 x D. 166/34	2	2	30	15	—	—
D. 14/33 x "	5	2	200	128	—	—
D. 14/34 x "	4	3	75	65	—	—
D. 166/34 x Co. 290	1	2	60	48	—	—
D. 166/34 x Co. 331	2	3	38	16	—	—
D. 6/37 x Co. 213	4	2	—	—	—	—
D. 6/37 x D. 3/34	3	3	—	—	—	—
D. 6/37 x Diamond 10	2	4	—	—	—	—
D. 2/39 x " 10	2	3	345	192	—	—
D. 14/40 x " 10	1	1	—	—	—	—
Total	28	27	768	472	—	—
Grand Total	196	172	6,007	3,094	21	.68

14. The 1943 seedlings are being basketed and transplanted to the field at the time of writing. Owing to war conditions all the transplanting will be done to frontland clay at Sophia.

15. Cane varieties imported during the year through the Central Plant Quarantine Station, I.C.T.A., Trinidad, B.W.I., were :—6 cuttings each of B. 35245, B. 37193 and B. 3439.

EXPERIMENTS REAPED.

16. The experiments reaped during the year have been fully reported on in Sugar Bulletin No. 12 and will not be further discussed here.

EXPERIMENTS IN PROGRESS.

17. There were 33 variety, 42 manurial, and 3 cultivation experiments in progress at the end of the year but it should be recorded that the experimental work has suffered considerably through shortage of labour, both at the Station and on the estates, inability to obtain fertilizers of the kinds and quantities required and at the right time, frequent changes and shortages in the staff and reduced travelling and transport facilities.

MISCELLANEOUS.

18. Table III gives statistics, for recent years, as to seedlings bred, field experiments started and reaped, cane cuttings distributed, cane samples analysed, etc.

19. Owing to war conditions, no Field Days were held during the year.

20. Meetings of the B.G. Sugar Experiment Stations' Committee were held on the 26th July and 15th November, 1943.

21. 200 cane cuttings each of Co. 421 and Co. 419 were shipped to Suriname, and 4 cuttings each of D. 166/34 and Co. 419 to Brazil.

22. The Book-keeper was robbed of $194.66 in October and the front wheels and tyres of the Station's truck were stolen.

TABLE III.—Statistics of Seedlings, Cane Distribution, Field Experiments, Cane, Soil and Root Samples, Canes Sold and Visits Paid to Estates, 1934-1943.

Year.	Seedlings basketed.	Cane Cuttings Distributed.		Field Experiments.		Cane Samples.		Soil Samples taken.	Root Samples taken.	Cane Sold to Pln. Ogle.		No. of Days visiting Estates.
		No. of Cuttings.	No. of Bags.	Started.	Harvested.	No. taken and analysed.	Cane crushed (Tons).			Deliveries (Tons).	Net Receipts.	
1934	24,147	39,978	307	30	58	2,425	53	400	560	1,305.87	2,767.31	197
1935	19,898	486,200	3,740	34	55	2,719	59	310	—	1,759.78	3,720.52	212
1936	23,210	509,600	3,920	60	71	4,804	40	258	—	1,605.45	3,378.75	258
1937	23,421	333,222	2,563	28	104	4,192	46	336	—	1,714.70	3,374.39	237
1938	12,151	221,780	1,706	17	104	3,263	34	38	—	1,697.05	3,219.35	174
1939	9,714	372,320	2,864	29	76	1,797	21	208	—	1,326.95	2,818.25	184
1940	19,557	430,950	3,315	41	56	559	14	42	—	1,114.40	2,657.55	216
1941	21,354	637,780	4,906	30	62	626	7	18	—	1,077.50	2,713.32	230
1942	6,007	881,660	6,782	28	74	909	21	9	—	1,476.70	3,718.98	212
1943	—	524,810	4,037	19	78	819	16	159	—	1,352.85	3,525.65	211

RAINFALL.

Table IV compares the 1943 monthly rainfall at the Sugar Experiment Station with the monthly averages for 1921–1943.

TABLE IV.—**Comparison of the Rainfall at Sophia for the year 1943, with the Average for 1921–1943.**

Month.	Actual Rainfall, 1943, Inches.	Average Rainfall, 1921–43, Inches.	Excess or Deficit, Inches.
January	18.35	9.06	9.29
February	8.79	4.07	4.72
March	8.92	4.56	4.36
April	13.25	5.89	7.36
May	17.60	11.44	6.16
June	13.26	14.47	— 1.21
July	7.57	11.19	— 3.62
August	4.88	8.16	— 3.28
September	0.92	2.53	— 1.61
October	3.77	4.14	— 0.37
November	15.00	5.70	9.30
December	19.17	14.73	4.44
Total	131.48	95.94	35.54

23. The unprecedented rainfall of December, 1942, was followed by five months of unusually wet weather and the crop suffered from flood damage in many areas. Precipitation was continuously sub-normal from June to October but in November it was nearly three times the average. In December it was also wetter than usual.

ACKNOWLEDGMENTS.

24. The cordial co-operation of the Staff of the Sugar Estates and of the Experiment Station is very gratefully acknowledged.

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15th June, 1944.